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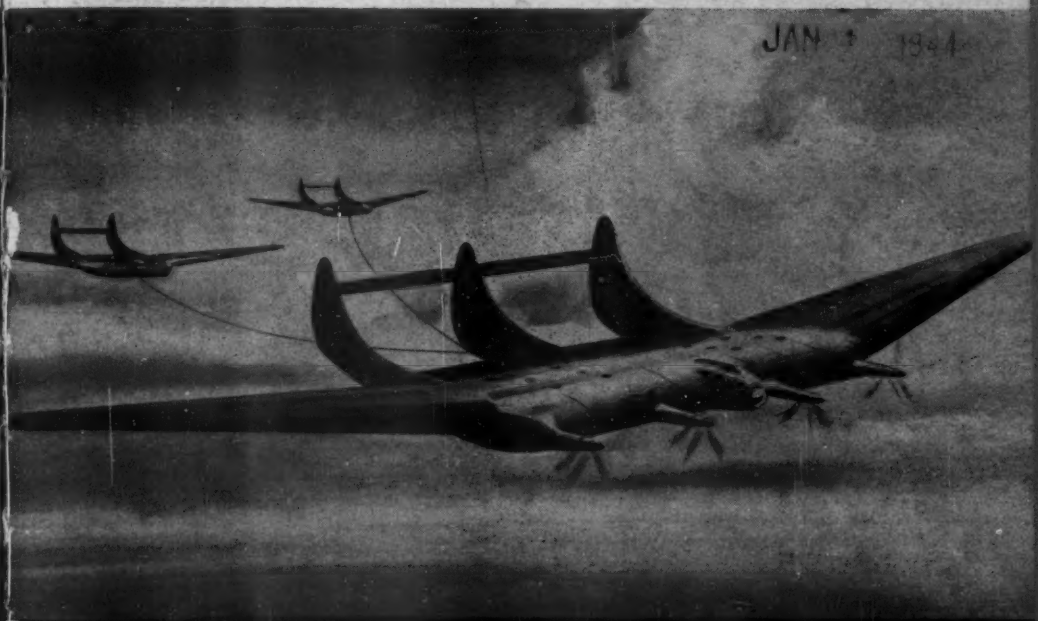

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There is only one way for any builder of an airplane engine to approach his job, and that is to make each part as fine as he is able to make it. ★ But in achieving this goal, Allison started with two special advantages. ★ One was the opportunity of drawing upon all General Motors' "know-how" in the perfection of manufacturing techniques. ★ The other was a privilege which had been ours for many years—the privilege of concentrating on assignments calling for high skill and precision in working with metals. ★ Perhaps we are aiming high, but with two such advantages it is natural our aspiration should be to seek to build ever finer aircraft engines.

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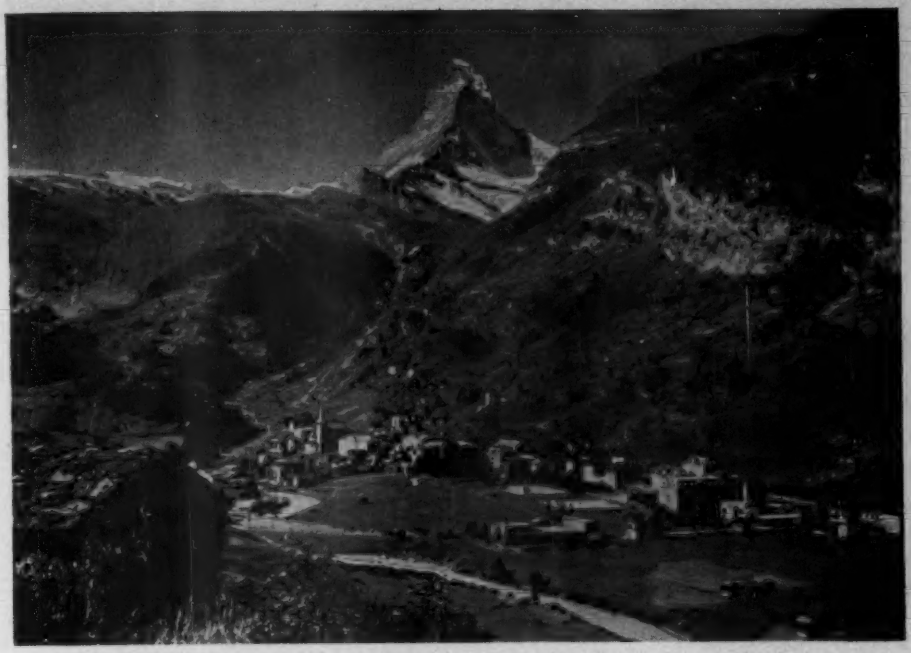


Zermatt and the Matterhorn

Switzerland Looks Ahead, Visions Airline to United States, Airport for Overseas Transport

Longtime Air Transportation Enterprise Promises Bright Future For United States-Swiss Trade

By Henry Pillichody

Special Representative of the Swiss National Office of Transportation

SWITZERLAND has always been among the first to put to good use the fruits of scientific and technical progress. She has practically no raw materials except "white coal," her immense water resources, from which she can obtain unlimited electrical power. From the beginning of aviation Switzerland has participated actively in its development despite her unfavorable topography. Indeed, this very great handicap seems to have given impetus to her pioneer endeavors.

Way back in the days of the "lighter-than-air" principle, Switzerland had already achieved great success in the field of aerostatic. In 1908, Army Air Force

Typical Swissair transport of prewar days, easily recognizable as the standard U. S.-built Douglas DC-3.

Captain Schaeck, one of the founders of the Swiss balloon troop, and Emil Messner, industrialist and president of the Swiss Aero Club, won the Gordon Bennett Cup race for free-balloons. Their world record of a non-stop flight of 73 hours remains unbroken to this day.

Professor Auguste Piccard, physical scientist of world reputation, performed his stratosphere flight with his specially built balloon in 1932 near the city of Zurich, which brought him to an altitude of well over 50,000 feet.

In the "heavier than air" field, as early as 1910, a plane piloted by a Frenchman, Legagneux, took off successfully from Swiss soil. Three years later the Swiss "pioneer ace," Oscar Bider, crossed the Alps, flying from Berne to Milan, and back to Basle.

No one who has had the privilege of flying over the snow- and ice-covered Alpine peaks, watching the landscape unfold below him, will ever forget its beauty.

After World War I, Switzerland began to organize its aviation, thinking even that early in terms of commercial air transportation. In 1919 passenger flights were organized from the lakes with hydroplanes. On June 1, 1922, the first Swiss international airline, operating on a schedule from Geneva to Nuremberg via Zurich, was opened. I flew the first schedule as pilot, on a Junkers F-13 plane, which accommodated four passengers quite comfortably in a closed cabin. The cruising speed of that first all-metal one-engine transport was about 80 miles per hour.

Cargo Total Exceeded Air Mail Even in 1931

This airline was operated only four months—until Sept. 30, 1922. But during that period, 60,000 miles were flown; 122 passengers and about 200 lbs. of mail were carried. And from that time on, Swiss international aviation developed rapidly. On March 26, 1931, the commercial carrier company *Swissair*, which has since achieved a great international reputation, was created. Its splendid safety record compares favorably with that of any air transport company in the world. In its first year of operation *Swissair* planes flew 1,350,000 miles, carrying 23,929 passengers, 528,000 lbs. of mail and 1,100,000 lbs. of cargo.

Walter Mittelholzer and Balz Zimmermann, the early directors of *Swissair*, both deserve particular mention among the many pioneers who did outstanding work for Swiss international air transportation. Both died in 1937, through causes not connected with aviation.

Mittelholzer, an exceptionally gifted pilot, made several pioneer flights: to Spitzbergen, through all Africa as far as Capetown, to Persia. He was the first man who flew over Kilimandsharo. Due to his efforts, *Swissair* grew by leaps and

bounds. As soon as reliable radio sets were available on airplanes, a blind flying device was successfully initiated and Mittelholzer further developed the art of instrument flying and the new method of abstract navigation.

Balz Zimmermann, a very capable engineer, showed great ability in securing and making available to the company the most suitable types of aircraft.

American Planes Sped Swiss Progress in 30's

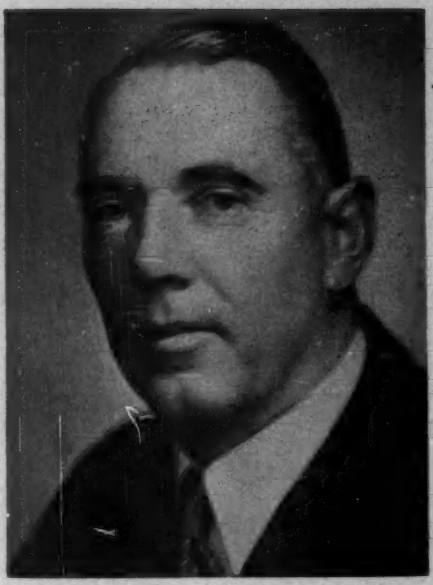
It is not surprising, therefore, that by 1932, in its second year of operation, *Swissair* took the initiative of introducing to Europe a small but fast flying American transport plane, the Lockheed *Orion*. Cruising speed thereby increased from 100 to 170 miles per hour. Further, pursuing this forward-looking policy, *Swissair* in 1935 changed all her flying equipment and purchased the Douglas DC-2. In 1937 this equipment was supplanted by the still more efficient Douglas DC-3 model, which also formed (as it still does) the basis of American commercial aviation.

These factors of constant progress both in the field of technical advancement, which materially aided safety of operation, and its use of the latest and best equipment, readily lent themselves to purposes of good publicity. The company very quickly became popular far beyond the borders of Switzerland. The growth of passenger demand is clearly demonstrated by the operating results and *Swissair* rapidly developed into a transportation institution, serving Swiss trade and travel interests to the utmost limit of that demand.

In 1938, the last pre-war year, *Swissair* planes flew 2,200,000 miles, carrying 66,852 passengers, 1,300,000 lbs. of mail, 700,000 lbs. of freight and 600,000 lbs. of excess passenger luggage (amount above the allowed 31.5 lbs.). With an increase since 1931 of 65 per cent in mileage flown, number of passengers transported was nearly tripled while mail became almost 2½ times as great.

Swiss Export Economy Favors Air Cargo

It is only logical therefore that Swiss energy and attention for some time past have been occupied with intercontinental



The Author

The Swiss National Office of Transportation has delegated Henry Pillichody, since 1914 a well known Swiss pilot and air pioneer, to the U. S. in order to study post-war transportation problems especially air transportation. Switzerland has chosen this outstanding expert as its representative because of his 30 years of flying experience.

During World War I, Mr. Pillichody was among the first military flying instructors. When peace came he was appointed chief pilot of the first Swiss air transportation company, Ad Astra Ltd., and in 1922 he was entrusted, together with Walter Mittelholzer, with the management of the company. From 1924 to 1928 he was a member of the Swiss Military Mission to Colombia, helping to organize the Colombian military aviation.

Back in Switzerland, he was entrusted with the organization of the Swiss air feeding lines and as such he was manager of the Alpar company. After the death of Mittelholzer and Zimmermann in 1937, Pillichody was called to take charge, in collaboration with Eugen Groh, of the management of the amalgamated Swissair, which position he held until 1942, when he was called to the National Office of Transportation. He has his headquarters at the New York office of the Swiss Federal Railways, which has been for the last 30 years under the management of Fred Dossenbach.

Richard A. Tennenbaum, who came from Switzerland to the U. S. in 1941 and has specialized in the study of transportation problems in relation to Switzerland has collaborated with Mr. Pillichody in the preparation of this article.

air transportation problems. These are of paramount importance to Switzerland, land-locked in the heart of Europe, with no access to the sea. Highly industrialized, Switzerland can exist only if her products can be exported throughout the world. Scarcely any other country is so tightly linked to international economy. She is among the leading exporting countries in proportion to population.

By far her largest overseas customer is the United States.

The principal items of Swiss export include many articles which seem to be predestined for air transportation, as they are of high value and comparatively light weight.

A few of these can be divided into the following approximate amounts per year: fine Swiss watches of world-wide reputation, 250 million francs*—pharmaceutical and chemical products, 200 million francs—silk and embroideries (especially novelties), 120 million francs—high quality instruments and precision tools (optical and mechanical devices), 50 million francs. These figures may not appear impressive in comparison with those to which America is accustomed, but it must not be overlooked that the population of Switzerland amounts to only 4,250,000—little more than half that of Greater New York.

Swiss Tourist Wonders Potential Air Magnet

To these goods, which are essential for an economically operated air traffic, must be added another important factor: the Swiss tourist traffic. People from all parts of the world came in a steadily increasing flow to visit Switzerland. This traffic would itself justify an air connection between the U. S. and Switzerland. It is to be expected that more people than ever will avail themselves of a rest in Switzerland, to enjoy the beautiful landscape and the benefits of her healthy climate, if the time element of the journey can thus be minimized. Switzerland's highly developed resorts for winter and summer sports, her well known sanatoria for rest and recreation, will have an even greater appeal to a war-weary world than before 1939. The highly developed and world-renowned schools have always attracted a great number of foreign visitors who wish to give their children a good education with an emphasis on international consciousness particularly stressed.

Switzerland is the home of the League of Nations, the International Labor Organization, the Bank for International Settlements, the World Postal Union, the International Railway Office, the International Offices for the Protection of Intellectual and Industrial Property and the International Red Cross. She will therefore undoubtedly be the scene of numerous international gatherings and conferences.

Last but not least, it should be mentioned that the Postal authorities naturally take much interest in flying routes connecting Switzerland with the chief centers of the world. All these facts have encouraged the Swiss to study officially and privately ways and means of linking Switzerland with future world air transportation systems, and of participating in the operation of these international and intercontinental airlines in which she is economically interested.

New Airport for Overseas Air Transportation

Switzerland has now "on paper" the project of an airport which is to be used exclusively for intercontinental-overseas air traffic and which will meet with all requirements for safe operation of large long-range aircraft. The location of that airport has been chosen in a favorable topographical situation in such a way that no hills or mountains will be in its neighborhood. Besides this project, the existing municipal airports situated close to the important industrial centers of the country will be enlarged in order to satisfy the increasing requirements of continental air traffic within Europe, which it can be safely assumed, will reach hitherto unknown and unforeseen intensity. To realize these projects, the Swiss Government is prepared to grant a credit of 200 million francs.

It has always been and will continue to be the policy of the Swiss authorities to welcome all foreign air transport companies which desire to fly on regular schedules to Switzerland, provided that

* The official rate of exchange of the Swiss Franc is 23 cents.

they can meet with the stringent Swiss aeronautical requirements and with the reciprocal condition that the Swiss airlines would have the same rights to fly to the foreign countries involved in such projects. Commercial agreements on a basis of mutual reciprocity, which worked very satisfactorily for both sides, have been concluded in prewar international air traffic between Great Britain and Switzerland, as well as with other countries in Europe.

Swissair was the only air transportation company in Switzerland operating on an international basis, for which she received very little financial support from the Government. In 1938 this subsidy amounted to only 15 per cent of the total revenue of the company. One of the company's most important customers was the Postal Authority. This will most probably continue after the war. Mail payment has never been regarded as a subsidy by Swiss air carriers, but as fair indemnity for the transportation of mail agreed upon in negotiations between the World Postal Union and the International Air Traffic Association.

Postwar Plans Outlined By Swiss Air Experts

Switzerland's international economy can only be successful by operating on the basis of bringing the highest quality to the world markets and on this principle all her transport systems have been organized. It is well known that for air traffic "the best" will just be good enough. Under the heading of "first quality" in air transportation, I mean first-class flying equipment, modern aircraft with the most comfortable accommodation for passengers, equipped with engines, instruments and other installations of the highest technical quality, giving an absolute guarantee of safe flying under all weather conditions. Special attention must be given to personalized service, which in its highest aspiration can never be too good, as I believe it is the most far reaching and satisfactory advertisement for any air traffic company.

A further policy which is a direct consequence of what I already have said, is to operate airlines, whenever economically possible, in *direct non-stop flights.*

Switzerland therefore intends to establish direct air-connections to all important commercial centers of the world with which she has sufficient trade relations.

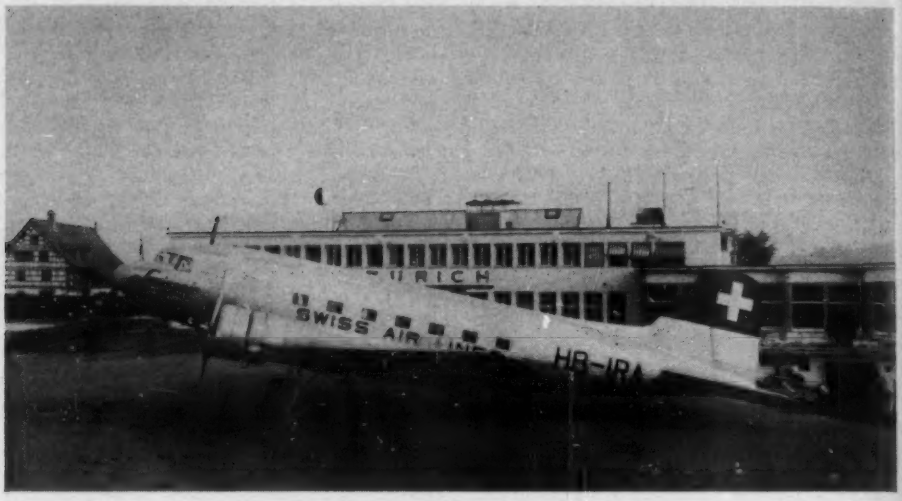
Beside the advantages in handling and operating, non-stop flights, are fast and safe, as each stop on the way entails a considerable loss of time. To reach or to descend from high altitudes needs time and makes economical flying on short distances questionable.

For all these reasons, Switzerland would favor a non-stop airline connection to the U. S. To give a practical picture of such a service, the following assumption can be made: Supposing the westbound flight from Switzerland to New York takes 18 flying hours at a very economical and conservative estimate of 220 miles an hour cruising speed the passenger would, in view of the difference of six hours between the local time of Switzerland and New York, actually seem to travel only 12 hours, as he can set his watch back six hours upon arrival at destination. To render the journey as comfortable as possible and at the same time most efficient for the business man—time will be of more value than money after the war—the plane should start from Switzerland at about 7 p. m. so as to arrive in New York the next morning at 7 a. m. Eastern time. On the eastbound trip the situation would be reversed, the flight being no longer in the direction of "catching up time," but actually in the direction of "swallowing time." The difference of local time therefore would have to be added to the actual flying time.

On the other hand, eastbound flying will be generally favored through prevailing west winds, which allow calculation of a greater cruising speed of 250 miles per hour, thereby reducing the duration of the journey to 15¾ hours. Taking the local times into consideration, the journey from New York to Switzerland will need 21¾ hours. The passenger will have to set his watch six hours forward on arrival at destination. A start in New York at 7 p. m. will bring the plane at its destination in Switzerland the next day at 4:45 p. m. local time.

Rates Would Be Lower Than Pullman Costs

Travel by air under the described conditions should be a very pleasant journey



Swissair plane at the Zurich air terminal.

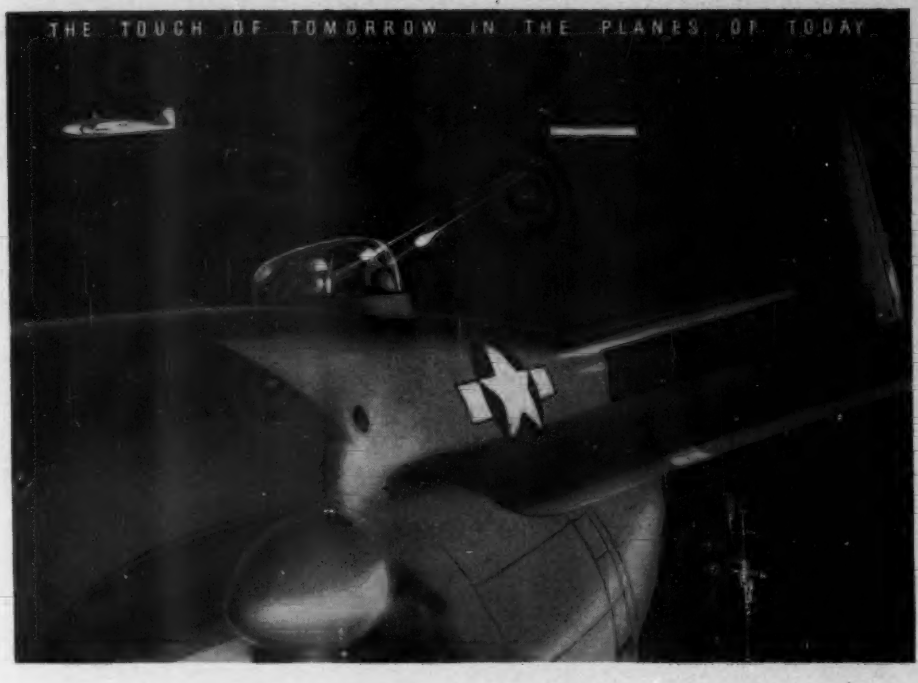
—an excellent bargain for all business men, as in the end it will be cheaper than a comparable journey by Pullman car and first-class steamer, even when figured at a fairly high passenger-mile rate. In my opinion, the customer is always willing to pay in proportion to what is offered and performed for him. It would be a false policy to offer the most qualified transport system at the cheapest price. It would even be a dangerous experience for the economic operation of air lines, for the aircraft is an instrument for which the sale price per number of passengers carried will be higher than the price for a steamer or a train. The running costs per passenger carried will be higher than those from the surface transport systems. In prewar times a journey from New York to Switzerland was a matter of a week, utilizing one of the large and luxurious steamers—the *Normandie, Queen Mary or Ile de France*—and first-class train accommodations. The fare, based on minimum rates was about $350, not including all miscellaneous expenses during the trip. That is one of the reasons why I believe that the same journey performed aboard one of the luxurious skyliners in a non-stop flight from New York to Switzerland, which will take less than one day, should not be offered at a lower price than $250 to $300. On the flight, the passengers will have no extra expenses whatever in comparison to those resulting from an eight day's journey.

Switzerland, one can be sure, will be an important link in the field of postwar global air transportation, for which rôle she is specially favored through her experience and her geographical situation. It is only to be hoped that we can, through mutual understanding and the long established friendship between the oldest and the biggest democracies of the world, resume traffic sooner after the war than is anticipated at present. This new medium of air connection should work to the mutual benefit of both countries, bringing them closer together, not only in distance, but in greater understanding and cooperation.

Boston Seeks Link To Midwest by Air

A link to the Midwest is sought by Boston's Northeast Airlines. The company has asked the Civil Aeronautics Board for permission to operate air routes through New York State to bind with routes of the Middle West.

S. J. Solomon, president of Northeast, seeks permission to operate a service covering three routes: Route 1 between New York and Pittsburgh; Route 2 between New York and Chicago via Buffalo and Detroit; Route 3 between New York and Chicago via Philadelphia, Pittsburgh, Cleveland and Toledo.



It All Adds Up To Subtracting Zeros

Today's apprentice gunner enters a deadly trade—defending American bombers against vicious attacks of Jap Zeros and other heavily armed enemy fighters.

To follow his trade and survive, the gunner first has to learn how to "polish 'em off around the clock." His training must be thorough and painstaking, and it must come within a hair's breadth of being the real thing. That's why Fairchild developed the GUNNER.

This advanced trainer has the essential characteristics of the bombers from which our student marksmen will soon shoot it out with Axis pursuits. From a power turret, similar to one on a Flying Fortress, each fledgling is taught to pick off tiny targets while moving at better than 200 miles per hour. It's fast, tricky work and it takes a keen eye, steady nerves, precision equipment. It's the kind of training that pays off when the chips are down.

Fairchild's GUNNER, from which apprentice marksmen step into bombers and thence into action, is one of the largest, speediest training planes used by the Army Air Forces. Powered by two 12-cylinder, inverted, in-line, air-cooled Ranger engines, the GUNNER is a typical example of Fairchild's "touch of tomorrow in the planes of today."

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Don't Believe All You See And Hear About Helicopters; Look at the Bedrock Facts

Their Commercial Future Too Bright To Be Spoiled by Exaggeration of Consumer Use, Says Grover Loening

By GROVER LOENING
Chairman, Helicopter Committee
National Advisory Committee for Aeronautics

TIME and again in aviation's history, an over-sanguine public appraisal of a new development gets way ahead of the facts—so much so as to cause a disappointment at finding a lesser future disclosing itself. There are repeated instances where a more modest hailing and approval of what a new development could actually do would have been much more helpful. No instance comes more forcibly under this influence than the present and future development of the helicopter.

Advertising artists have gone completely overboard—Buck Rogers' predictions are leaping at conclusions that just cannot be justified, in the way the picture magazines are letting their imaginations run away with themselves. This is creating a near future objective for the helicopter to reach which is just not in the cards. All of this talk that the helicopter is to be flown by everyone from grandma to the tired businessman right after the war for suburban commuting, and going shopping, and attending the movies, is being so hurtfully overdone that we must call a halt to it.

The helicopter's future is far too great to have to face a period of disappointment and disillusionment when it will need faith in that future to the greatest degree to tide it over its development period. . . .

The true picture today, faced honestly, is that the helicopter for the next few years is limited to usage by professional aviators and professional aviation companies—and is not at all a vehicle to be placed in the hands of the public. As a matter of fact, as things stand today, the helicopter is an even more professional apparatus than is the airplane.

The eminently successful pioneering of Igor Sikorsky has given us our real start in this field. Other developments in this country are now going on apace. There are some 70 or 80 different designs being worked on, 10 or 12 of which will presently be successful, three or four of which —Piasecki, LePage, Young, *et al.*—are currently flying well. The Army, Navy and Coast Guard after a little hesitancy are now placing strictly military orders and developing strictly military uses for the helicopter which cannot be disclosed excepting in a very general way. The National Advisory Committee for Aeronautics is proceeding now with an ambitious program of research to make sure that no stone is left unturned in exploring the fundamentals of this problem in the interests of safety for the helicopter pilot and success for the technical development of this field in America.

So that you may be able to see for yourselves the general principles involved in the helicopter's operation and the necessary limitations that these now involve, we must examine its structural features.

Helicopter vs. Autogiro

To begin with, there exists considerable confusion between the autogiro and the helicopter. The autogiro is fairly near being the same thing as an airplane. It has a fuselage, and a tail for control, and a propeller that pulls the whole works through the air. On an airplane, as you know, this motion causes a lift on the wings. It does exactly the same on the autogiro, except that the wings are a rotating windmill of several vanes instead of a fixed wing. . . .

Now the helicopter, although it looks like the same breed of cat, is quite different. First, the helicopter has no airplane engine-propeller combination pulling it through the air. Instead, the power of the engine is applied directly to a rotor—a rotor that looks like an autogiro and has the same principle of hinged blade and centrifugal force holding it out—but a rotor that is inclined to the air stream exactly the opposite way of the autogiro. Instead of the air flowing up through the disc, the helicopter rotor causes the air to flow into and downward through its disc. This causes the helicopter rotor to act just like a propeller in deriving thrust, the only point being that this thrust is largely vertical and is so powerful that it lifts the entire weight of the aircraft, and has in addition got enough excess power to enable it to be tilted forward, with the simple result that at the same time that it is lifting, it is also getting a propelling force that in itself drives the machine through the air and overcomes the resistances.

This would all be a simple picture were it not for another fact. The autogiro rotor is a freely spinning pinwheel. The helicopter rotor on the contrary has the power of the engine directly applied to it. As a result, the helicopter rotor introduces the element of torque. This torque, as you know, merely means that since the engine and the propeller are trying to rotate against each other, one or the other must be kept stationary, and if you want lift out of rotating the propeller, the body in which the engine is mounted has to be kept stationary in space. This leads to the introduction into the helicopter field of anti-torque systems and devices. One of the earliest developed to a high state of perfection by Sikorsky, is to use an additional small vertical propeller at the rear of the body, the thrust of which is sufficient to compensate for any tendency for the body to swing around against the rotation of the mainlifting rotor. . . .

In addition to the different types of helicopters—and there are numerous other types—there are variations about which the engineers are deep in argument as to how to provide for balancing the forces of the advancing blade and the retreating blade when the whole works starts flying forward. . . .

With the structural technique and engine power available, we know we can lift the loads vertically, and there are several different systems for obtaining the forward velocity out of a lifting blade and balancing the forces. There remains the very important element of control—to give the pilot the ability to do what he wishes with his machine.

In the Sikorsky R-4, this has been brought to a high degree of perfection by the use of what is called cyclic pitch control. The angle of the blades as they sweep through their circumference can be adjusted at any time, so that every blade when it passes a given region gets the same increase or decrease in angle. This results in lifting that side of the machine, and is a universal control that enables the helicopter to be directed in anv direction at all—forward, sideways or backwards. Then at the same time, an additional control permits of raising or lowering the angle or pitch of all the blades at once, still leaving the differential control available. Raising them all at once to a larger angle increases the lift, and results in the vertical upward movement of the helicopter, whereas decreasing them causes the machine to descend. The control is therefore complete—in fact, amazing—in both hovering and forward. sideways or backward flight. There is only one hitch, however. The controls are delicate and require careful coordination and are not easy to master without sufficient training. . . .

The net result of all this is that the helicopter at present, and for many years to come, is hard to fly—requires the coordination of five controls—and

for that reason is far less suitable for the use of the ordinary layman than is the airplane.

Any notion, therefore, that everybody is going to fly helicopters right after the war is nonsense, because the amount of skill necessary to fly these machines correctly and with safety is even greater than is now required of an airplane, and is, of course, very much greater than is needed to drive a car.

This serious limitation is not insurmountable by any means. In due course of time, the three airplane controls used for balancing can be placed on an automatic piolt mechanism and in due course of time, engineers and designers will develop a governor that will assure the proper rotor speed without any manual action on the part of the pilot. So that eventually after many years of development, which I should estimate at between five and ten years, the controls of the helicopter will finally become sufficiently simplified to make these craft available for more general public use.

Speed Seriously Limited

Another serious limitation is the fact that helicopters are fundamentally limited in the high speed that they can attain as at present designed. Again referring to the advancing blade, since its speed is always the sum of its speed of rotation, plus the speed of advancing of the whole machine through the air, it more quickly reaches the limiting air flow breakdown speed of sound than would an airplane. This speed of sound is around 1100 feet a second and trouble in shockwaves has been run into by airplanes at around 800 feet a second. Since in large sizes it is rather impractical to develop the rotors to give the necessary lift without having a tip speed of hovering rotation alone of much under 400 feet a second, this leaves about 400 feet a second for forward velocity which would be equivalent to about 270 miles an hour. This is definitely in the high bracket and it is not likely for many years that helicopters would be developed that would fly much over 200 miles an hour. By the time that many years come around, there will be many airplanes flying around 400 miles an hour.

Another very serious limitation of the helicopter is a definitely poor performance at increasingly high altitudes. As at present envisioned, it is not an efficient machine in rarefied air if it is efficient at sea sea level air.

There are also limitations on size that are quite serious, but this might be met by the development of multirotor machines.

Many of these limitations are due to preserving the requirement that a helicopter must at any time with engine dead be able to become an autogiro and autorotate to a safe landing. Present helicopters can do this. However, as the art develops, it is not certain that this requirement need be continued. We may find that it is a deterrent to development that is not warranted. Possibly the development of twin-engined power plants or of parachutes or some other emergency device might allow of a heavier disc loading that would be far more efficient than the light disc loading that autorotation requirements still demand.

Future Bright Nevertheless

Because there exist these limitations, however, does not mean that helicopter development has too restricted a future. On the contrary, when handled by professionals, its professional future immediately after the war is the one that will be wide and extensive.

This means that helicopters will be flown by airline companies, hired pilots in the employ of individuals in some cases, and of companies in others. *There will be fleets of helicopters used on delivery systems for merchandising companies*, operated by professional aviators; there will be fleets of helicopters used in short-range feeder airlines, also operated professionally. Mining companies and oil companies will hire trained pilots and purchase helicopters that will be used to carry personnel and goods to inaccessible places, and to use in exploration.

The U. S. Coast Guard is almost certain to end up in all its lifesaving, ice patrol, law enforcement, and coastwise work, by having over 90 per cent of its air fleet in the form of helicopters. At the crowded beaches of summer resorts, the catamaran that has to be launched through the surf to go out to rescue a drowning person, will be rapidly replaced by a lifesaving helicopter that takes off the beach and lands in the roughest kind of water right at the

WHATEVER BECAME OF THE AUTOGIRO? That's a question often asked in these days of reams of publicity about helicopter which, because of its resemblance, many people consider the same thing. The 'copter has the center of the stage today, but both may one day play a big part in air cargo. Here's the difference, as defined by engineers of the AAF Materiel Command:

HELICOPTER AND AUTOGIRO—The autogiro (top), actually a trade name for one type of gyroplane, has a conventional propeller for drawing it forward and conventional tail surfaces. A big rotor, however, replaces the fixed wing as a means of obtaining lift. The rotor is not power driven, but rotates as a result of aerodynamic forces acting on it when the craft is moving forward. These forces turn rotor fast enough to keep the craft in level flight at forward speeds as low as 25 to 30 mph, and thus enable it to take off and land from smaller fields than a fixed wing airplane. The helicopter (bottom) now being extensively tested at Wright Field, has no need for conventional propeller or tail surfaces. Main rotor is power driven. Consequently helicopter's lift is not dependent upon forward motion of craft. It can however, take off or land vertically. Moreover, by manipulating the pitch of the blades on this main rotor, the helicopter can be moved in any direction. Small rotor in rear counteracts the torque of main rotor which tends to spin fuselage in a direction opposite to its own. Small rotor is also used as a rudder by increasing or decreasing blade pitch. If engine should fail, main rotor is automatically disengaged, and turns freely like autogiro rotor, thus making possible a safe landing.

spot where the drowning person may be picked up.

Of course, in war usage, one of the most outstanding features in which the helicopter could be used at once is in ambulance work, to lift out wounded casualties from inaccessible places.

In addition, a war use that has been much talked about would have been the use of helicopters from the decks of vessels against submarines. There is little doubt that had the submarine menace continued as seriously as it looked a year or two ago, this development would have assumed great importance. There are, of course, countless other military uses for the helicopter, particularly due to its ability to operate in the roughest and thickest weather. Fog is not a detriment because in the helicopter you merely slow up when you are near obstacles. Ice is worrysome at the moment, but developments are under way which will greatly reduce this limitation to helicopter usage. All manner of reconnaisance, command movements of officers, liaison work, can all be done with extraordinary facility by the helicopters that we see before us already today. We always end up with that tremendous advantage—that terrain and weather have so little effect on the helicopter's adaptability. But always one must bear in mind that this ability to land and take off and operate from places so inaccessible that even a jeep cannot get to them, are always subject to being done in the hands of an expert pilot, a pilot who can coordinate those five controls.

What the future types are likely to be is still not clear. There are too many technical developments still to be perfected in this field.

The subject of vibration alone has just barely been scratched and is a very serious matter. The cost of construction of the helicopter is still high. Some designers are giving a great deal of thought to a "roadable" type of helicopter. That is a vehicle that can fly when you want it to and then land and go along the road as an automobile. This is a lot easier to do in the helicopter than it is in an airplane which would have the difficulty of folding large wings, but in these combination ideas, there is always the pitfall that one might end up with a poor car on the one hand and a poor helicopter on the other. In addition to that, the very versatility of the helicopter's being able to land anywhere makes the roadable idea less necessary, and the fact that the helicopter cannot for years as yet be sufficiently simple to allow operation by the average person would not make its use as a car very attractive.

Right after the war, the development is more likely to go along the lines as indicated, of professional users—airlines, companies, individuals who can afford a chauffeur—always with that serious limitation that we still have a vehicle in the helicopter that requires important coordination to operate correctly, that requires expert maintenance, that requires knowledge of navigation, judgment of distances, and a degree of quick alertness. All of this sums up to a limitation that will not hurt its promising professional future, but that will definitely fail to meet, for a few years at least, the Buck Rogers picture magazine helicopter millenium.

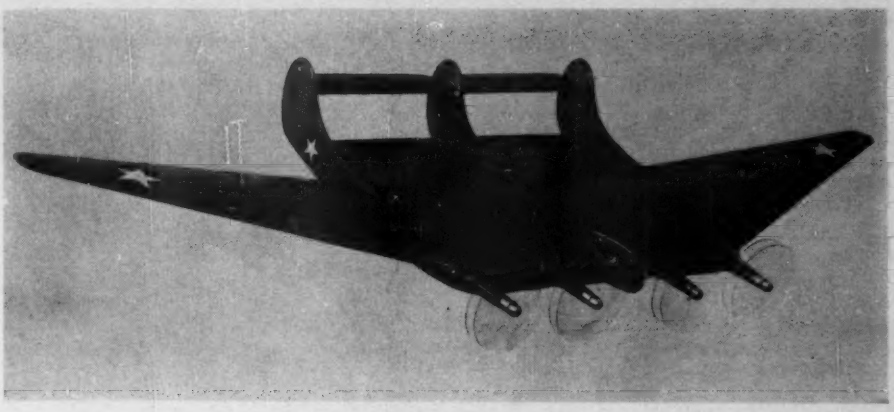
One of the first sound steps to take to advance toward making the helicopter a vehicle that might compete with the automobile in the more distant future, is to recognize these limitations now and not expect too much of it too quickly. Give the engineers a chance to work out the difficulties—there are plenty of them, but in time they will work them out. Meanwhile, we can proudly say this—that America is notably in the lead in this phase of aircraft development—way ahead of the rest of the world. Let us be sure to stay there.

Sikorsky Helicopter Goes on Exhibit

The first helicopter in this country to fly successfully—the Sikorsky VS-300—has been presented to the Edison Institute at Dearborn, Mich., to join other outstanding "firsts" in aviation in the museum there, it was announced by Eugene E. Wilson, vice-chairman and president of United Aircraft Corp.

The VS-300 first took the air on Sept. 14, 1939, with Mr. Sikorsky at the controls. He was faced not only with the problem of designing a helicopter which would fly but also with the task of learning to fly the craft without any instructor.

On May 20, 1940, Mr. Sikorsky received the first helicopter pilot's license ever issued in this country—Connecticut No. 1.



Flying Refrigerator Cars Mapped by Colonial Airlines On 8-Cent Ton-Mile Basis

40-Ton Payload Visioned As Enabling Record Low Rate; Design Features 'Flying Wing'

A 120-TON flying wing "Ice Box", refrigerated fruit express plane hauling a 40-ton payload at the unprecedented low cost of eight cents per ton-air-mile, is the appealing postwar plan of Colonial Airlines and its President Sigmund Janas.

The Canadian Car and Foundry Company Ltd., one of Canada's largest aircraft manufacturers, licensees in Canada under Burnelli Flying and All-Wing patents, are developing the plane for manufacture in conjunction with V. J. Burnelli, New York inventor.

Newsmaking feature will be lateral loading of cargo into the gigantic Flying Wing; the first practical type of lateral loading, Colonial pointed out. This procedure is sure to work vast changes in air cargo handling and greatly speed up farm-to-store delivery, one of the air transport industry's major potential problems in planning postwar traffic.

The new plane will embrace the use of large unit containers of 2½-ton capacity, quickly detachable from an ordinary produce truck at the airport, and swiftly loaded into the plane with apparatus similar to that now employed in loading blockbusters into bombers.

Another feature will be the powering of the plane by four 5,200-horsepower duplex gasoline or Diesel-type engines, in the latter of which events cheap, low grade fuel can be burned. The engines will

drive counter-rotating propellers—two propellers mounted on a single shaft, it was announced.

Florida fruit will be delivered to New York and Montreal produce markets within 14 hours after it is picked, President Janas predicts. Refrigerating units in the plane will keep produce at scientifically correct temperature for retention of original freshness and highest vitamin content.

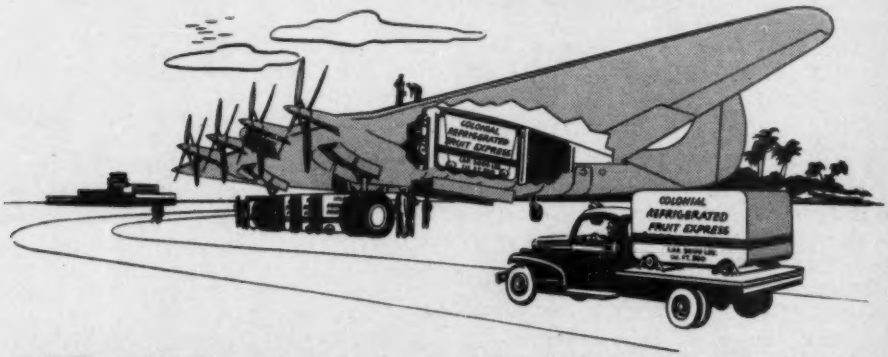
The plane will carry enough fuel to haul its load of perishables non-stop from Miami to Montreal in nine hours, an air distance of 1,590 miles. Under these conditions fuel consumption will approximate 750 gallons an hour, average cruising speed 180 m.p.h., and average flying altitude 10,000 ft. Wing span of the plane will be 210 ft. and body 71 ft. long. It will have 1,950 cubic feet of excess space for air mail and miscellaneous freight in addition to space occupied by a full volume of produce, it was pointed out.

In further explanation of the loading feature, Colonial's announcement said that large unit container of plastic plywood are planned. Measuring 6x6x10 feet with a capacity of 5,000 lbs. each, these are designed for quick removal from a truck chassis and loading into the plane. They are particularly adopted to lateral loading which the shape of Flying Wing permits. The plane will accommodate sixteen of these containers.

Distinct advantages of the semi-tailless Flying Wing under consideration compared with conventional planes were cited. Hours now lost in loading will be eliminated by prepacking into containers at the produce warehouse instead of packing at the airport, it was said. The effect of this procedure will be to speed up the overall delivery service by air as well as to increase the utility of the plane. Balancing and anchoring of plane cargo, a current problem, will be far less critical because of lateral loading. The unit containers will eliminate the bulk and weight of fruit crates and individual packing, thus increasing the plane's capacity and enabling it to carry produce at a record low rate, the planners believe.

Other advantages claimed include the ability of the Flying Wing to take off and alight on shorter runways, its economical construction due to elimination of compound curves in the flat formation of the Wing body, heavier payload per gross weight and greater safety factor due to accessibility of landing gear and engines in flight.

It will be possible for the plane to tow two or more gliders increasing its overall payload and permitting the plane to pick-up or drop cargo at intermediate points, without interrupting its flight. However, this step awaits future technical developments, it was revealed.



***FLYING WING** refrigerated fruit express designed for Colonial Airlines' postwar transportation of perishables from Florida to Canada (Miami-New York City-Montreal) by Vincent Burnelli, inventor of the Flying or All-Wing type of airplane. The Canadian Car and Foundry Co., Ltd., licensee in Canada under Burnelli Flying and All-Wing patents, is developing the plane for postwar production.*

Capable of carrying a 40-ton payload at the unprecedented cost of eight cents a ton mile, the plane, it is said, will enable Florida growers to market their fruit in New York or Montreal 14 hours after fruit is picked. A lateral loading device will permit containers of two and one-half tons to be lifted directly from trucks into the plane in much the same manner as block-buster bombs are loaded.

Fruit Growers Look To Post-War Gliders

Chains of Gliders To Bring Fresh Produce North Envisioned

By Earl W. Brown

IT is quite probable that in post war days Florida's perishable fruits and vegetables will travel to northern markets by glider trains.

A transport plane will pick up a glider loaded with tomatoes at say Bradenton, Fla., another glider load of citrus at Winter Haven, a third with strawberries at Plant City. This glider train will arrive in New York the same day with its cargoes of fruits and vegetables.

Multiply this glider train by as many times as will be necessary to supply America and you have a picture that may well become a reality in post war days.

Any discussion of foods today must necessarily be a discussion of vitamins and many vitamins are lost in processing foods, particularly fruits and vegetables.

America has been educated to demand fresh fruits and vegetables whether from home gardens in summer or available only in a few states in winter. These can be supplied from Florida gardens by air transportation to a large part of North America all through the winter.

Markets for perishable products have been reduced to distances measured by hours instead of miles.

A glider train may sound visionary, but there may be more phenomenal feats than that in store for the transportation of tomorrow. When the war is over and industry can return to peace-time production the advancements made under war necessity can be capitalized upon. Pilots and planes will be transferred from military to civilian needs and great aircraft factories are geared up to any possible production for peace-time needs.

The reason for employing gliders as cargo transports hinges on the simple law that more weight can be pulled than lifted. This is the reason for locomotives plus cars, autos plus trailers, tugs plus barges. Towed by a regular transport plane, three gliders weighing 2,500 pounds and with a wing area of 800 square feet will each lift about two tons of freight and carry it at a speed of about 150 miles per hour. The carrying capacity of the tow plane, four tons, is thus increased to ten tons.

More efficient gliders with greater carrying capacity are continuously being built. What good roads did for the automobile, the new military air fields will do for the airplane. Florida has more air fields than any other state. Many of them are in out-of-the-way farming communities, but after this war those places won't be out-of-the-way any more.

Gliders may ease their way into the transportation of products of a farming community much as trucks have done in the past decade, picking up a load of agricultural produce at the state market or local packing house. A glider can come down wherever there is fifty feet of flat ground. It can take on a load and be picked up by the tow plane without the latter landing—just as a mail bag is picked up by a plane.

Gliders have a mobility that may enable the grower to sell his produce where the demand is greatest. The pilot does not have to land his glider train in one piece. If the demand for strawberries, for example, is greater in Richmond than in New York, he can turn loose his glider loaded with strawberries over Richmond. Because of the speed with which the fruit reaches the market the grower may meet the immediate demand before the market

The Author

EARL W. BROWN *is one of the best known men in the State of Florida which he has served for over thirty years. At present he is Florida manager of the Smaller War Industries Corporation, a government organization to promote the interests of small plants handling war contracts, with headquarters in Jacksonville. He was formerly chairman of the Board of Directors of the Babcock Aircraft Corporation of DeLand.*

Brown has lived most of his 53 years in DeLand. For twenty years he held city offices of mayor, secretary of the Chamber of Commerce, and city manager. For the past ten years he has been manager of Florida National Exhibits, organized to advance the agricultural, industrial and tourist interests of Florida at international expositions and elsewhere throughout the United States.

Brown has extensive citrus groves and herds of beef cattle. He is an enthusiastic hunter and fisherman and knows every corner of the state.

price changes and thus increase his profit.

As perishable fruits and vegetables become more easily available in the winter in the north they will become more and more a part of the national diet. Luxuries will become necessities. As all parts of the country become nearer in terms of time they will become closer in their eating habits.

Such a fleet of cargo air trains daily flying Florida produce to the big markets of the north is not as fantastic as it may sound. In South and Central America, where continental air transportation is much more highly developed than in this country, perishable fruits and vegetables are carried almost exclusively by air. TACA—Transportes Aereos Centro-Americanes—the world's largest carrier of aerial freight, makes a butter-and-egg run regularly stopping at interior points of Central America to pick up eggs, cheese, lard and butter.

Packers in Buenos Aires do a thriving business flying Argentine steaks two inches thick to residents of Santiago, Chile, some 800 miles away on regular schedule and selling them, air cargo rate included, at the price of a hamburger in New York.

With the good roads and excellent train, truck and steamship freight service in the United States, I believe the bulk of our freight will still be carried by their well-tried carriers after the war, but where the time element is important, as in the movement of perishable fruits and vegetables, glider trains may well be a logical means of transportation.

This article grew from a speech delivered by the author before the Sanford, Fla., Rotary Club.

Baby Chicks Flown To Ecuador Farmers

Chilean farmers are helping Ecuador's El Oro Province to re-stock her poultry raising areas, and airplanes are hastening the enterprise. El Oro Province, once devastated by border disputes, is engaged in an emergency rehabilitation project, assisted by the Ecuadoran Development Corporation and the Institute of Inter-American Affairs, Washington.

Recently the demonstration farm at Machala found itself in need of chicks for courses in poultry raising. Word was sent to a large poultry farm near Santiago, Chile. Soon the necessary priority ratings were established and the first shipment of 1,000 young chicks were on their way to Machala.

Packaging Engineers Make a Contribution to Tomorrow's Air Cargoes

Partial Elimination of Warehouses Foreseen in New Freight Methods

By J. H. Macleod
Vice-President, The Hinde & Dauch Paper Company
Sandusky, Ohio

TO stress the importance of packaging as an outstanding subject for immediate consideration in post-war air cargo transportation, I wish to point out at the very beginning that Air Cargo, Inc., a research organization sponsored by the airlines, lists packaging as the *first* of sixteen major distributing factors entering into post-war air transportation. Since air cargo is a living reality and is no longer to be classified as wishful thinking, and since it is destined as the last word in modern transportation, with unlimited possibilities, it will pay air shippers handsome profits to thoroughly analyze and immediately investigate the packaging materials available for use and capable of guaranteeing the safe arrival of their merchandise.

Among all the available materials suitable for packaging air shipments, there is no other one that can fill the same wide range of uses, there is no other one that meets air cargo requirements so completely, as the corrugated box. I'd like to call to your attention that the airplane for air cargo transportation and the corrugated box for packaging air shipments have much in common. Many of the same basic construction and service principles apply to each. For instance, both are designed to provide the greatest amount of load-carrying strength with the lightest construction weight possible; both have adopted "arch construction" to eliminate excess weight and to add strength and ruggedness; the airplane promises quick, and safe delivery—the corrugated box assures speedy packaging and sealing, and its durable, lightweight construction means safe arrival at lower transportation costs.

Perhaps a little background will serve to illustrate the limits of the corrugated boxes' usefulness and its outstanding growth in use.

Forty years ago the corrugated industry was as new as the air cargo industry is today. It wasn't until 1903 that corrugated boxes were approved for use in freight shipments. In that year the Central Freight Association approved corrugated for use in the Central territory. Cereals were the first products shipped in corrugated boxes. In 1904 the shipping privilege was extended to cover the territory of the Eastern Trunk Lines. Manufacturers, other than those producing cereals, were not so fortunate in obtaining freight classification concessions. Consequently, prolonged discussions and debates continued, and it was not until 1906 that the Official Classification Committee of the Freight Carriers Association authorized the general use of corrugated shipping boxes nationally.

This new freight box quickly grew in popularity. Some of the credit for its quick rise to fame was due to the discovery of processes by which corrugated shipping boxes could be attractively printed. But the corrugated industry had plenty of

work ahead to combat the conservatism on the part of those manufacturers who acknowledged its economy, but were skeptical of the practicability of the corrugated box. However, every new user converted to the use of corrugated boxes became a staunch believer, hence sales obstacles, once overcome, rarely cropped up a second time.

The swing to corrugated boxes became more and more pronounced as product after product joined the ranks of those already being shipped in these "new type" boxes. Finally—or perhaps I should say, believe it or not—the problem became "what not to ship in corrugated boxes." During this period package engineers in the Hinde & Dauch Package Laboratory established "sample service," a customer insurance feature that called for a thorough test before the corrugated box was adopted for a new product in a new field.

Corrugated Box Use Doubled Since 1929

The phenomenal rise of the corrugated box has continued through the years. Nothing will serve better to establish the truth of this statement, than a comparison of value between the shipments of 1929 and 1942. In 1929, corrugated and solid fibre box shipments mounted to 140 million dollars. By 1942 the value of these shipments rose to the substantial figure of nearly 367 million dollars. This increase is due to the expanded use of corrugated materials and to the multitude of different products shipped in corrugated boxes. Where, in the beginning, only cereals were shipped in corrugated boxes, we now find items ranging from fresh fruit and furniture, to bicycles and baby chicks.

Today, while the complete packaging needs and requirements for post-Victory air cargo shipments are not entirely crystalized, I feel positive that the specialized experience of the corrugated shipping box industry will come forth with entirely satisfying answers to all air cargo packaging problems, as rapidly as they reach our attention. Of course, it has always been our aim to find better packaging methods before problems have a chance to arise, and as usual this will be our plan of procedure for air cargo.

Remember the heavy wood boxes used for shipments of paints, varnishes and lacquers just a few years ago? Well, when we considered entering this field we were faced with a double problem. Part of the problem was making a box to safely carry the product. This we succeeded in doing after much hard work. But paint products had always been shipped in a standard package of six one-gallon cans, and our box carried only four. Paint manufacturers claimed using our box would reduce orders. We countered with the suggestion that two units of four be substituted for the original unit of six. They accepted the idea and the double-wall corrugated box, long under experiment and test, was accepted. It received marked success and resulted in increased orders, too. Today, practically all paint and allied products are shipped in corrugated boxes.

China, glassware and pottery were another group of products benefited considerably by this new packaging method. Corrugated boxes succeeded in taking these things out of barrels thereby producing the healthy advantages of reduced breakage, lower transportation costs, elimination of fire hazard, simplified warehousing and stock control, improved selling methods for the dealer, plus customer satisfaction in general. Pre-packaging got its first real foothold with this group of products. When the boxes arrived at the dealer's, he could open and sell from one, keeping the others intact for delivery to customers without the bother of unpacking and repacking, as was necessary when barrels or wood boxes were used.

War Proves Utility Of Light Packaging

The war-time service record of the corrugated box is truly fascinating. Mountains of war supplies and Lend-Lease goods already have been safely transported from this country to all parts of the world. Outstanding in this service is the V3c type corrugated box. Within its rugged walls, war supplies such as torpedo directors, dry-cell batteries, sun helmets, paints, lubricating oils, tank batteries, practice bombs and scores of other important Victory items are all going directly to the scenes of action.

Other outstanding and highly interesting examples of the war-time service of corrugated boxes are those we have specially designed and manufactured for ship-

ping bomber noses, turret tops, bullet-proof gasoline tanks, wing tips, rudders, wing flaps and ailerons to the aircraft assembly plants.

And now the corrugated industry is ready to pack for air cargo shipments on a large scale. In the selection of packaging materials, we realize there is no one material that is a "must." We also know there are quite a few acceptable packaging materials, but I wish to repeat that corrugated is the ideal material. The very nature of air cargo shipment problems strongly indicate a wide usage of corrugated packaging materials in post-war air transportation.

Bulk A Big Problem Even in Giant Planes

The main problems that confront air shippers today are the restrictions on the size and weight of air shipments. Doors of commercial planes now in use aren't large enough to accommodate over-sized packages, and floor loading is restricted to certain weight limits. Tomorrow's planes will erase these problems and if we can rely on advance information, it won't be in the too distant future. But a problem that must be well considered now, and for all times, is the elimination of all unnecessary bulkiness in packages for shipment by air. This bulkiness means wasted plane space, excessive transportation charges and increased packaging costs. Weight of air shipments must always be kept at a minimum. Air shipments receive careful handling, hence, while they must be packed securely, they do not require massive crating. Today, shipments too large to handle, can be loaded into planes if they are repacked into small units. Corrugated boxes are ideal for this purpose, as well as a reliable replacement for bulky packaging.

Let us imagine a manufacturer regularly using air transportation for some product that is packed inefficiently, from the standpoint of bulkiness.

Let's say he has an extra half-pound of packaging materials on each of the packages he ships. If he were to ship just ten packages a day, his inefficient methods

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would mean the payment of extra transportation charges on five pounds of air cargo for each air mile every day plus the additional cost of the wasted packaging materials. In a year's time this figure would represent a sizable amount. So, the further we look into post-war air transportation, the more evident it becomes that packaging air cargo shipments efficiently must concern everyone that intends to make full use of this modern transportation method.

The packaging of a normal air cargo package presents no serious problem after you have once decided on the most practical and efficient shipping box or wrapping material. Cargo compartment charts and shipment size charts, furnished by the airlines, give simple and easy-to-understand instructions.

With the packaging material selected and these charts and instructions as a guide, you pack and seal just as you would for surface shipment, providing of course, that the packaging material selected is acceptable in view of the modern trend toward the elimination of excess bulkiness and weight.

Lend-Lease Experience Produces New Data

With the coming of the Lend-Lease Program, the government began exhaustive studies in conjunction with packaging engineers to determine the best packaging methods to produce saving in time, space and materials; to cut waste and lower transit damages. Represented in full force were the package engineers from the corrugated box industry. Their findings have resulted in war-time packages that are bound to influence greatly the packages of the future.

Properly engineered corrugated boxes provide plenty of protection for the product in transit. This builds customer goodwill, decreases complaints and prevents costly replacements. Lightweight, strong, sturdy construction, designed and engineered to meet specific air transportation problems, corrugated boxes are the safe and sure remedy for many an air shipper's headache.

Corrugated boxes can be obtained to answer almost every possible air shipment problem. There are boxes that conserve storage space, boxes that lend themselves particularly well to certain types of special packing procedures, boxes which are most efficient when sealing methods, handling operations, and loading practices have been established. Corrugated boxes are the solution to most air shippers' packaging problems. For many years, package engineers in the corrugated box industry have diligently investigated all packaging methods and packaging materials with the idea of developing the most efficient package design, at least possible cost. Their findings are available to prospective air shippers—they welcome the chance to turn their knowledge to solving air cargo's packaging problems.

In addition to corrugated boxes, there is available a tough, flexible corrugated material which combines the protective qualities of corrugated paper with the folding qualities of heavy kraft wrapping paper. It wraps and packs at the same time, provides tailor-made packages at a real saving. In shipment of small, odd-shaped items this material is ideal. The "close-fit" possible with this material eliminates the use of over-size cartons, excelsior and shredded paper for inner packing, and reduces delivery costs to a minimum. Bulky items, difficult to wrap and protect, are safely protected with this corrugated wrapping material. You just cut the material to the proper length, "mold" it to the shape of the object, and seal.

A war-time packaging requirement that has gained prominence due to the necessity of shipping materials to the Aleutians, Alaska, Africa and the south Pacific, deals with methods for temperature and humidity control, the elimination of corrosion, mold formation and insect infestation. These problems aren't as serious as they appear at first. They are easily and simply overcome by using any of the new bag packaging or overwrapping materials recently developed. The contents of the shipping box can be enclosed in one of the special materials. In both cases the packages are heat-sealed to guard against the problems I have mentioned. Some of the prominent materials used for bag packaging or overwrapping are special and laminated papers, laminated cellophane bags, and kraft bags and papers. After the war we will be doing global shipping and these special materials will provide excellent advantages for this super service.

Air cargo men predict that skyway de-

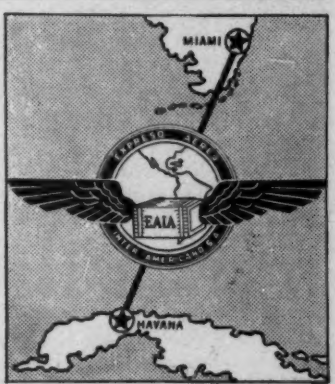
livery and transportation service will carry every kind of perishable goods. They boldly claim they will carry all high-cost freight such as jewelry, furs and frocks. They say they will be handling all vegetables and fruits requiring ice in transit, promising that cargo planes will supply them "fresh" the year round. They further promise that fruits and vegetables, unknown to us now, will become a part of our daily diet. They likewise say they will be handling tool steel, repair parts for automotive equipment, automobiles and other types of machinery.

If this prediction were to come true, and it looks very much as if it will, the biggest benefit for the manufacturer would be the partial or entire elimination of costly warehouses. That the air cargo prophets have contemplated additional surprises for air shippers is definitely assured. The "knowing smiles" that light their faces when they are questioned about coming events is a positive indication of their long-range plans.

The predictions of air cargo men makes me, a packaging man, wonder what will be in the packages of tomorrow. It is not hard for me to visualize strange, but luscious fruits arriving from distant tropical lands; unknown foods from far distant airports for Sunday dinner; hand-made products from central Asia; or scientific phenomena, in their original state, for examination and study in our schools. Yes, these things interest me, but not with the same intense interest I have in the things we will package right here at home. Packaging possibilities have no ceiling.

Mr. Macleod's article is adapted from a speech he made at the Air Cargo Engineering meeting held in Chicago on Nov. 8-9 under the sponsorship of the Chicago section of the Society of Automotive Engineers.

Fly Your Freight to Cuba



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AIR CARGO PERSONALITIES

WILLIAM A. COULTER

President, Western Air Lines

FAMILY tradition endowed William A. Coulter as the head of an eastern coal-mining company, but an active interest in aviation installed him as president of Western Air Lines, the only airline with headquarters in the West. A rare business acumen has made him a tremendous success at both.

Born the son of General Richard Coulter, statesman and military leader of Greensburg, Pa., William A. Coulter is naturally a leader, too, but a quiet and unassuming one, not addicted to fanfare. Consequently he is most often found working steadily behind the scenes.

To Western Air employees, President Coulter is a symbol of good judgment. He travels the airline and meets them with a humility which would match their own, and in his wake follows great respect for his quiet dignity.

He is probably the only toprank executive in the industry, says a key WAL spokesman, who can meet the press and get by with a homespun interview on everything but how many planes and how huge those planes will be after the war.

The story has been told along the airline "grapevine" about how a Salt Lake City reporter stumbled into Western's president quite by accident in the terminal coffee shop. It wasn't until after the two had exchanged quite a conversation on the latter's being "bumped" from the ship to let a paying-passenger through to Los Angeles that the reporter realized that here was not just another Western employee, but the "head man!" So impressed with the president's down-to-earth personality was the reporter that he went back to his office and wrote a magnificent yarn which hit most of the nation's major newspapers.

Similar stories are recurrent along the line. Perhaps he has turned up in a gas rationing line alongside the company photographer, or at a crowded terminal cafe counter rubbing elbows with his cargo clerks, but the twist of the story is always the same and the ending inevitable.

Coulter stepped to the aviation front as early as 1934 to become the largest stockholder in Western. Immediately, changes in operation were evidenced with the advent of the Douglas DC-3 coach and sleeper transports, as well as the Boeing 247-D's. Schedules were stepped up and the airline slipped into high gear with a stretch northward to Great Falls, Mont.

During 1939, the company reached a new high in passenger traffic and reported a net profit of $74,556 and by the end of 1940 Western Air passenger totals surpassed previous year by 55 per cent, with revenue-passenger-miles up 42.5 per cent.

In 1940, Coulter took over the reins as president and in 1941 WAL went international—to Lethbridge, Alberta—linking Alaska and United States through northward connections at the new terminus.

Today, still guided by Coulter, Western operates over a 1,500-mile route from California to Canada, in addition to a cargo route to undisclosed war fronts under contract to the Air Transport Command. At Salt Lake City, the airline operates the second largest Airline War Training Institute in the nation.

In the near future, Western plans to inaugurate service to San Bernardino, Palm Springs, and El Centro, California, and between Los Angeles and San Francisco.

And at the helm, you can be sure, will be President Coulter, the product of Princeton who has become known from New Jersey to California as the twin-roled executive of a coal mine and an airline.

Airline to Cover All Alaska

Formation of the first commercial air service to cover virtually all of the territory of Alaska has been announced by R. W. Marshall of New York, director of Alaska Airlines. The new airline is formed by the consolidation of several individual companies which operated in the territory to form a system covering sixty-three cities. W. N. Cuddy, president of the First National Bank at Anchorage, is president of the new airline, with headquarters there.

Atlantic Record Set by T.-C.L.

A transport plane of the Trans-Canada Air Lines in the Dominion Government's Transatlantic Service recently established a new Montreal to Britain record of 11 hours and 56 minutes. This was thirty minutes less than the previous record made by a T.C.A. crew in the first flight of the new service on July 22.

The transport carried the Hon. C. D. Howe, Minister of Munitions and Supply; H. S. Symington, K. C., President of Trans-Canada Air Lines, and J. R. Baldwin, of the Privy Council.

Merging of Air and Water Transportation Is Called A Logical Development

No Industry Owns a Patent On Art of Flying, Declares Head of the President Lines

By Henry F. Grady
President, American President Lines, Ltd.
Former Assistant Secretary of State

EXPERIENCE has brought to us a realization of the difficulties which attend modern business. Facing the postwar period, with its many perplexing problems and necessary readjustments, there is little reason to believe that all will be smooth sailing. There are, however, certain phases of the indicated development of American industry, commerce and trade, when hostilities cease, which to my mind are fascinating food for thought and as to which I believe there are exceptionally bright prospects if we maintain the proper perspective, and approach the problems involved realistically and with common sense.

When we turn then to think of the place which will be occupied by commercial aviation in the postwar period, we can allow our imaginations almost unlimited bounds without surpassing the realm of possibility. This is the type of enterprise that fascinates the American businessman. We are happiest in the creation of something new; in the building up of industries, commerce and transportation systems.

All of us have thought of the great increase in airmindedness of this Country when the war is over. With more than two million men in the Army Air Service, and considerably more than one hundred thousand pilots, it is natural that these men who have learned to fly will be contemplating some form of employment which relates to aviation or air transport. Obviously there will not be sufficient volume of production to give employment to all of those now engaged in it; and there will likewise be curtailment in air transport as compared with the vast military services of today.

However, there will unquestionably be substantial expansion in all phases of aviation over pre-war. It would appear reasonable even to expect a boom in aviation. From simple personal inclination many more people will endeavor to retain their connection with airplane manufacture or air transport than these activities will be able to support. Some of us can still remember the cycles through which the automobile industry and wireless telegraphy passed before they became stable and developed into industries of first importance. What then should we expect as the evolutionary cycle of aviation in the postwar?

It is only natural that the transcontinental airlines should seek to extend their service to overseas destinations, and I do not know of any reason, within certain limitations, why the privilege should be denied them.

The Author

Henry Francis Grady came to his present post from a career whose distinction is exceeded by few in American industry or transport. Starting as a lecturer at the College of the City of New York, and at Columbia University (where he won his Ph.D. in 1927), he joined the bureau of planning statistics of the U. S. Shipping Board in March, 1918, as a special expert.

In 1919-20, he was U. S. Trade Commissioner to London and the Continent, acting commercial attaché at London and later in the Netherlands. After a short stretch as research chief of the U. S. Bureau of Foreign & Domestic Commerce back in Washington, he returned to university life, and from 1928 to 1937 served the University of California as professor of international trade and dean of commerce.

In May, 1937, he was back in Washington as vice chairman of the U. S. Tariff Commission. After two years he was appointed Assistant Secretary of State, serving to the end of 1940, when he assumed his present post at American President Lines Ltd. He served as a member of the League of Nations economic committee since January, 1937. Twice since mid-1941, he had undertaken special missions for President Roosevelt: first to the Orient for an economic survey of numerous countries supplying strategic war materiel, and from March to June, 1942, to India as a member of the American Technical Mission.

By the same token, there is no reason why these relatively new airline companies should be given sole access to established overseas trade routes at the expense of surface carrier companies which may have pioneered and developed these routes and in which they have heavy investments of time, money, experience and equipment. I say "at the expense" of present surface carriers because unfortunately the present civil aeronautics act of 1938 has been interpreted in such manner as effectively to eliminate common carriers, other than air carriers, from the general air transportation field in the future.

Competition Needed

This country has been developed through a system of healthy competition. In the earlier frontier days, with so many opportunities, there was no necessity for governmental regulation or monopoly prevention. If a field was crowded, the enterprising citizen turned to another where opportunities were still abundant. As we have grown to maturity and as these abundant opportunities have been developed, it has been necessary to introduce more governmental regulation. I have no doubt that with regard to aviation such restraining influence as may prove to be necessary in the public interest, can be exercised through sound government regulation without interfering with wholesome competition through private enterprise.

Therefore, if a transcontinental airline wants to spread its wings to overseas destination, I say "more power to it"—provided it is not given an unfair advantage at the expense of some well-established American steamship company already in that particular trade.

It should be made clear, as I have pointed out before, that the steamship industry is not seeking protection from airline competition. It is merely asking the right to meet that competition on an even basis, to be allowed the use of air transport to develop and advance further its own service in accordance with demands of the trade and in the public interest. No individual nor industry owns a patent on the art of flying. It is a science that should be available to all who are qualified to use it in advancing the cause of social and business welfare. To deny its use to the steamship industry would be equivalent to putting the latter in an economic straight-jacket which in time might mean

the virtual dissolution of the American Merchant Marine.

Since its inception, and I think properly so, there has been a subsidy in the development of aviation. This is not unusual in the infancy of industries. Had this not occurred we would have been in a very much more backward state, aviation-wise, than we were at the beginning of the war, and we would have suffered extreme handicaps as a result. Technical argument may be made as to the character of the subsidy paid, but I think it is obvious that airmail pay in excess of the real value of the service rendered is a subsidy in fact. I think it has been a sound policy and I see no reason for shrinking from a candid admission. I believe the American people recognize this fact; have been and are prepared to meet the issue squarely. We can only project the economic possibilities of overseas aviation in the postwar era.

Post-War Subsidies

Where it will be necessary to provide government aid to sustain the quality and quantity of aircraft, and maintain service over the routes which the public interest requires both in the carriage of commerce and in proper military protection, no one can tell. Obviously we should not subsidize two American companies to compete with each other. Such would be a wasteful expenditure of public funds. There may be exceptions to this rule, but as to all such matters we believe it may be safely left to a proper governmental body to determine whether the circumstances in a given case justifies a permit or franchise. And there should, of course, be governmental determination of whether a subsidy is needed, and if so in what amount.

In the case of steamship companies, we envision the utilization of aircraft integrated with ships over the customary routes, between the customary terminals, as a combined transportation system. There are many advantages which would flow from such an operation. Most of the steamship companies will have operated over these same routes for a great many years. Through their main and branch offices and agencies, reaching into the countries served, they will be in touch with the sources of business and acquainted with the patrons to be served. If they are well-managed and properly operated steamship companies (and no others should have the privilege) they will enjoy the confidence of the travelers over these routes; know the customs of the people and the type of service desired; and will be in constant touch with the sources of business and traffic development.

Reduced Flying Fares

They will only need to add the special technicians required for the actual flying and maintenance of the aviation equipment. Through the reduced overhead possible in such instances, the overall cost which must be borne by the traveler will be considerably reduced and this should be reflected in the passenger fares.

Through this medium it may be possible, as time goes on, to operate overseas aviation without the need of a government subsidy. This should be the ambition of every industry. I have heard no suggestion from the steamship companies, who envision such an operation, that Certificates of Public Convenience and Necessity should not be given to the strictly air companies; nor have they suggested any restriction upon fair and healthy competition between the air service given over the steamship routes in this manner, and the air transport services of the strictly aviation companies.

Well-managed and far-sighted ship operators of such a service, will seek to develop each mode of transportation to its fullest state in the public interest. Surface vessels should and will be built of the size, type and speed which will fit into the joint picture in a manner to best serve the traveler and shipper. Every effort will be made to continue the development of the aviation partnership of such a system, and to furnish the type of service required. Otherwise air travelers would transfer their patronage to the services of the strictly air companies. Thus we would have healthy competitive conditions, with the surface carriers fitted snugly into the picture as a complementary factor.

Some steamship companies have grown up with the country. They have passed through the various stages and modes of overseas transport from wooden and iron sailing vessels to speedy and elaborate modern luxury liners. Over the years they

have served the same trade routes and succeeding generations of patrons. There is no reason why they should not be permitted to continue the progressive policy of the past as long as they do not restrict or encumber the development of aviation as such.

Mergers in Britain

Many foreign steamship companies, notably Cunard-White Star, Bank and P. & O., have announced their intention of utilizing aircraft in international trade in conjunction with their post-war steamship services. A few months ago a new Swedish company was organized for the development of Sweden's own inter-continental air routes after the war, particularly those to the United States. Officials of the Johnson Line, the Trans-Atlantic Line and the Svea Steamship Company were listed as the principal backers of the new airline.

France, Germany, Holland and other maritime nations already had integrated air and water combinations prior to the outbreak of World War II, and it is presumed that all such countries which are able to resume international trade will continue according to the pattern set. C. I. Geddes, of the British Orient Steam Navigation Company, The Duke of Sutherland, W. L. Runciman, Lord Londonderry, Viscount Rothermere and other British spokesmen for the shipping and aviation industries have all expressed themselves recently as favoring a strong unified system of British overseas transport.

If American steamship companies are denied a similar privilege of utilizing aircraft in international trade they will be at a great competitive disadvantage. Denial of the privilege will not only hurt our merchant marine, but will hamper and retard development of our air transport systems as well—because each separately must then compete against the unified air and water combinations of the world's leading maritime nations.

Governmental assurances, either legislative or administrative, that steamship lines will not be discriminated against in the matter of air transport are in the spirit of

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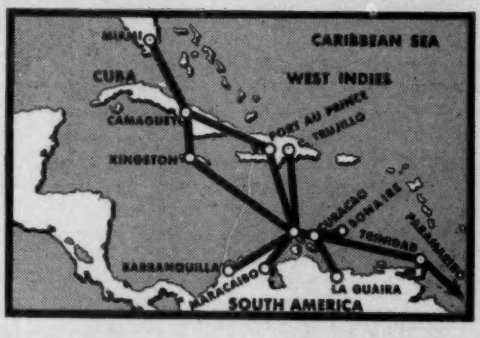

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the principle of freedom of air upon which the President and Mr. Churchill have declared themselves. If the British Empire and the United States are to make available each other's facilities in the matter of airports for refueling of planes and the discharge of inter-country passengers it would be unfair and one-sided if British steamship lines were to have a participation in over-seas aviation which is denied to American ship operators.

I believe the post-war period will find many who desire to travel by air, but I also think there will be very large and substantial numbers who will prefer, as in the past, surface transportation. Businessmen who must reach their destinations quickly, and others whose time is limited, will desire the faster transport. Those who have more leisure or who desire more comforts than can be provided in the airplane as we know it today will seek the relaxation of the ocean voyage. Steamships will provide ample promenade and cabin accommodations, excellent cuisine and entertainment, at speed fitted to the economy and other requirements of the trade. As to the airplane of the future, our vision is less clear.

Place for Steamships

Undoubtedly there will be rapid improvement and great additions to traveler comfort. There appears, however, ample opportunity for water and air transport to advance side by side in a complementary fashion. It has always been the practice for ships and planes to furnish weather reports and other aids to navigation, when plying the same route. Where this comes under one management, such reciprocal aid could be greatly intensified especially with the development of new types of scientific navigation in the post-war.

The background of the denial of this contention arises out of a theory that one mode of transportation will endeavor to participate in the development of another mode (in this case, aviation) not for the purpose of developing and furthering the progress of the new mode, but rather for the purpose of restraining it to protect the investment which it already has in what might be considered a competing method or system. Section 408 (b) of the Civil Aeronautics Act of 1938 provides that a common carrier may not acquire control of any air carrier unless approved by the Civil Aeronautics Board, which shall not approve any such acquisition of control if it would result in creating a monopoly or unless it finds that the transaction proposed will promote the public interest by enabling such carrier to use aircraft to public advantage in its operations.

This provision does not in terms prohibit a steamship company from itself directly establishing air transportation. It has, however, been construed by the Civil Aeronautics Board, as expressing an intent on the part of Congress that no carrier, including steamship companies, is to be permitted to engage in air transportation unless such air transportation enables such carrier to use aircraft in its own operations. There is fear that this restriction might be interpreted as applying to the use of aircraft as feeder services or like employment.

The United States Chamber of Commerce recently appointed an International Transport Committee comprised of twenty-six members. On this committe were eight representing aviation operating and aviation equipment manufacturing companies; eight from ship operating and ship-building companies; six representatives of shippers, and other representatives of the general public. This committee spent four days in sessions studying the problems of International Transport in general, and gave much time to the subject matter of the memorandum it prepared. Its conclusions are summed up in its recommendations to the Directors of the United States Chamber as follows:

> "American steampship companies should not be precluded by law or administrative ruling from ownership and operation of airplanes in international commerce."

It is noted that the recommendation refers to international commerce. It should be pointed out that this committee was only authorized to deal with international transportation.

There is pending before Congress a comprehensive bill amending the Civil Aeronautics Act. This bill is now before the House Committee on Interstate and Foreign Commerce. It does not, in its present form, amend Section 408 (b) mentioned above. However, a member of the committee is reported in the public press as having expressed the hope that

the House Interstate and Foreign Commerce Committee would stand by its decision to prevent other forms of transportation from entering the aviation field.

It is possible that air transport companies may endeavor later to have the bill amended so as to specifically prohibit steamship companies from engaging in overseas air transportation. It is contended that the subject is not susceptible of so simple a solution. Great damage might be done to the development of overseas aviation if such a restrictive provision were adopted. The matter should be thoroughly explored and discussed, particularly in view of the fact that no such restriction is contemplated by foreign governments on their steamship lines.

It is not contended that unregulated and limitless competition should be engaged in. Adequate government regulatory bodies are already established and functioning, and to these can be safely entrusted such regulation as is necessary to insure the fullest development of all modes of transportation, each in its own particular field, to serve the public interest.

I do not believe that Congress intended to restrict the development of aviation in the manner construed by the Civil Aeronautics Board. Great damage might be done to the development of overseas aviation, as well as to the development of the future American Merchant Marine, if unnecessary restrictions were adopted which would precent the cooperative effort of these two forms of transportation. I do not think it is logical to increase the costs of service through unnecessary overhead by maintaining two entirely separate organizations to serve the same trade routes. This in a true sense would handicap both air and surface operators and American overseas business as a whole.

I am convinced that sound reasoning and the public interest will prevail, but I think it is our duty to bring the matter forcibly before the responsible Government authorities, including the members of Congress, so that the whole question in all of its ramifications, may be completely understood.

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IT'S AN Air WORLD

By L. A. GOLDSMITH, *Economic Analyst,* AIR TRANSPORTATION

WHEN a comic strip is preserved for posterity in the *Congressional Record* and termed "worthy of immortality" by the Congressman who reads it into the record, that's news. And when the accolade comes as a recognition of an aviation talk to a newly fledged pilot, that would seem to be aviation news.

Aviation Talk in Comic Strip Goes Over Big; Makes Congressional Record

The script of this strip is significant in its emphasis on the basic importance of teamwork in all phases of aviation performance—as well as the debt which today's pilots owe to those who have gone before. In the words of "Colonel Corkin":

"It wasn't just you who earned those wings . . . a ghostly echelon of good guys flew their hearts out in old kites to give you the know-how. . . . And some smart slide-rule jokers sweat it out over their drawing boards to give you a machine that will keep you up there shooting."

Publication of this *Terry & the Pirates* strip in newspapers with 20,000,000 circulation occurred on Sunday, Oct. 17. On Monday, Oct. 18, Rep. Carl Hinshaw of California went before the House, and read into the *Record* his tribute: "In the comic strip appearing in the Sunday newspapers of Oct. 17, there has been presented by Milton Caniff one of the noblest sentiments in a lecture which he caused 'Col. Flip Corkin' to deliver. I consider this deserving of immortality, and so that it shall not be lost completely I present it here, and only wish that the splendid cartoons in color could also be reprinted."

ANESIA PINHEIRO MACHADO, Brazil's premier woman pilot, was invited to the U. S. early this year as the guest of the Government in an invitation issued jointly by the Civil Aeronautics Administration and the Office of the Coordinator of Inter-American Affairs to take the training courses given by CAA at the Houston Standardization Center.

Aviatrix Anesia Pinheiro Machado An Extraordinary Personality—Versatile Almost Beyond Belief

Though the training privilege extended to the Senhora is not permitted at the moment to our own women fliers, this special opportunity was created for her. Now that she is qualified to give instruction, on her return to Brazil she will be able to give necessary training to Brazilian pilots. She already holds three U. S. licenses.

Her marks in her studies were close to perfection—truly impressive because this training is given in very technical English, not her own language. Many of our own pilots have been washed out in such courses, but the little lady from Brazil fought her way through the obstacles and came out a conqueror. Her individual motto is the one word *Volo,* chosen because in Latin it means *I will,* and in Italian *I fly.*

Her versatility is almost bewildering. She is a really renowned flier, and she looks like a little doll when dressed in the fashionable feminine apparel. She speaks Portuguese, Spanish, English and French, and is the only distinguished guest of the Co-ordinator's office who has broadcast to the entire hemisphere in all three of its major languages—Portuguese, Spanish and English. Her husband is Acting Brigadier General Antonio Appel Neto, commander of Brazil's Fourth Air Zone.

When I asked her what she had in mind for the immediate future, she answered very solemnly. First she said, "I want to express my appreciation to this country, for through your Government's invitation I have realized the great dream of my life. Now I am returning to my country and what I want to do is very simple: All that I can for aviation—for my country—for Inter-Americanism—and to help win the war."

With the Aid of the Airplane Reader's Digest Plans Postwar Publishing in Major Capitals

LISTENING to Barclay Acheson, director of *Reader's Digest's* international editions, at the recent Foreign Trade convention was a great experience. Stressed was his interest and belief in the airplane and in its potent influence in future world development. He told how he had sat with the pilot who flew him recently to Europe and how the pilot had hammered home the point that "Nations that were far away ten years ago will be in each others laps when the war ends."

Mr. Acheson also told us that "with the aid of the airplane we plan to print *Reader's Digest* simultaneously in the major capitals of the world, as soon as the lights are turned on again."

Hitchhiking by Air Has Arrived: Business Week's Foreign Editor Thumbs His Way By Air to Naples

THE saga of the sergeant who hitchhiked his way by air from Algiers to La Guardia Field in 19 days with a 10-day stopover in England, has nothing on John Chapman, foreign editor of *Business Week*. He returned just a short time ago from an extended air trip to England, Gibraltar, North Africa, the Near East, Sicily, Italy—finally reaching Naples just three days behind the Army. He had to thumb his way by air from Algiers to Naples.

The campaign in Sicily had moved too fast for the normal military methods of transporting war correspondents. So it was up to the individual correspondent who wanted to get there "fustest" to use his own ingenuity. He rode in a jeep from field to field until he found a plane ready to take off in the direction he wanted to go and willing to take him. No easy job, thumbing by air, while carrying your own personal equipment, including a portable typewriter.

Mr. Chapman was deeply impressed with the work of the AMG and the way they had the situation in hand at Naples. Many AMG officers are lawyers, and some are bankers. Others have been municipal officials in the U. S., or traffic experts. Nutritional and agricultural specialists are also among this group as well as merchandising men.

Air "Taxicab" Makes Bow General Mark Clark Uses Plane To "Taxi" to War Conference

WHILE on Naples, it was recently reported that General Mark W. Clark was summoned to a military conference in that city, but found 20 miles of clogged roads before him. So what? He simply called for two of the smallest planes available and took off with some aides for Naples. A little while later the inhabitants of that city were startled to see these two tiny planes circle over one of their main thoroughfares, and then land without ado, right in the street. After the conference, the General took off from the same street, and vanished skywards. It certainly *is* an Air World, and no mistake about it!

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Acme Overseas Express, division of Acme Fast Freight, Inc. (*see adv't*), 88 Lexington Avenue, New York 16, N. Y.

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American Export Airlines, 25 Broadway, New York, N. Y.

Expreso Aero Inter-Americano S. A. (*see adv't*), 33 N.W., First Ave., Miami, Fla.

British West Indian Airways (BWIA), 630 5th Ave., New York, N. Y.

Compania Nacional Cubana de Aviacion S. A. Prado 252, altos, Havana, Cuba.

KLM Royal Dutch Air Lines (*see adv't*), 521 Fifth Ave., New York, N. Y.

Pan American Airways System (*see adv't*), Chrysler Bldg., New York, N. Y.

Pan American-Grace Airways (*see adv't*), 135 E. 42nd St., New York, N. Y.

Trans-Canada Air Lines, 673 Fifth Ave., New York, N. Y.

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Chicago & Southern Airlines, Municipal Airport, Memphis, Tenn.

Colonial Airlines Inc., 630 Fifth Avenue, New York, N. Y.

Continental Air Lines, Municipal Airport, Denver, Colo.

Delta Air Corp., Municipal Airport, Atlanta, Ga.

Eastern Air Lines Inc., 10 Rockefeller Plaza, New York, N. Y.

Inland Air Lines, Inc., Casper, Wyo.

Mid-Continent Airlines Inc., Municipal Airport, Kansas City, Mo.

National Airlines Inc., Municipal Airport, Jacksonville, Fla.

Northeast Airlines Inc., Commonwealth Airport, East Boston, Mass.

Northwest Airlines Inc., 1885 University Ave., St. Paul, Minn.

Pennsylvania-Central Airlines Corp., National Airport, Washington, D. C.

Transcontinental & Western Air Inc., 101 W. 11th St., Kansas City, Mo.

United Air Lines Transport Corp., 5959 S. Cicero Ave., Chicago.

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Progressive Spirit Cannot Be Measured With a Slide Rule

So Says United Air Lines' Cargo Chief, Looking to Future of Plane Freight

By C. P. Graddick
Director of Air Cargo Department, United Air Lines

AIR cargo transportation faces many problems, but with the genius of American engineers, the skill of American craftsmen, the ability of American manufacturers and, more than all, the progressive spirit of the people of our land, we will conquer the obstacles standing in the way of the development of a great air cargo transportation system.

The important factor is the spirit of progress of the American people. It is the most potent force on earth. The regulatory body or the research unit which does not give proper weight to that spirit and to the traditional acceptance by the peoples of Canada and of the United States of the developments of speed and progress in transportation, will make unwise decisions and erroneous predictions. The slide rule expert who will make the most accurate long-range predictions is the one who has added to the regular scales on his rule another set of intangible figures which will enable him to measure the weight of the public desire for progress.

For several years air cargo transportation has been a greatly debated subject. Some parties to the debate have used extreme examples in order to bring out their points more clearly. Many of the predictions were right when properly reconciled by the time element or by the geographical location of the operations. There were many examples of super operations or of operations over terrain without, or with little, surface transportation. Costs often were expressed only as direct flying expenses without regard to capital, overhead of administration, ground expenses, and so on. This caused much concern to many of the most genuine air cargo enthusiasts. They feared the results of public reaction to an illogical expansion based on misleading premises.

Those who recalled the over-expansion of air routes after the Lindbergh flight (with its disastrous results) were more cognizant of the danger. A number of our leaders advised against over-optimism. W. A. Patterson, president of United Air Lines, in one of the most widely quoted of air-cargo speeches, pointed out that air cargo filled a special need, and that it would not supplant railroads and truck lines but rather would supplement and complement them. Some have criticized Mr. Patterson for using present-day equipment for his comparison, rather than basing such comparisons on plans of the future. Practically none of the critics take into consideration that they must likewise expect the railroads also to improve their equipment.

About the time we went to war we had an example of a non-stop Diesel-engine

freight train operation between Chicago and the coast, on which reliable type-of-operation cost data is not yet available. And there is little commercial cost data available on plane operations other than those of the type of plane used by Mr. Patterson in his comparisons. No matter what other examples may have been used, they would have shown that the airplane will not put the railroads out of business. There is plenty of room for all of us to do a big job in the field for which we are best fitted in this transportation business.

Mr. Patterson knows that air cargo has a great future. He is one of its pioneers. He shows his faith in air cargo "in deeds and in action."

What of the Railroads?

How are we going to develop a great air-cargo system without hurting the railroads and trucking companies? We will take some of their business. We will carry the manufactured goods and the products of the land which need speed. We will change many distribution methods. We will develop new business. In doing this—in cooperation with the railroads and the trucking companies—we will make an even more abundant life in America and in the world than we have ever had before and that era will provide business for all. There is nothing startling or impossible in this statement. We have seen the development of a great system of highways, a network of truck and bus lines, and yet we have a constantly improving railroad system. Certainly adjustments have been necessary—and more will be necessary with further developments of air transportation. However, air cargo will get its volume from so many different sources and over such a period that it is quite likely that radical adjustments will not be necessary.

There seems little need to go into a discussion of all the commodities which will be available for air cargo transportation after the war. Just prior to the war, machinery repair parts made up a large part of air cargo business. Such commodities will continue to contribute heavily to the total volume. Some manufacturers undoubtedly will find it less expensive to pay higher air-cargo transportation rates to distribute smaller parts from the home plant than to maintain large branch houses with corresponding expenses of investment, maintenance, insurance, taxes, additional personnel, and so on. In fact, every enterprise doing business on a national scale will probably find it necessary to survey the possibilities of air cargo to determine if it would or should change some of their methods of selling, distribution and receiving. Competition probably will force it. One flower-grower in California began to use air express for distant markets. All had to follow suit. One automobile manufacturer who finds he can reduce a two-million-dollar stock to one of several hundred thousand dollars by using air cargo for emergencies, thus reducing the price of his car or parts, will force others to make similar changes.

Many persons question whether the public will pay the higher cost for transportation of cargo by air. Undoubtedly the rate will effect the volume. The rate probably will be prohibitive for many products. But let's review a little history. Let's ask a few questions.

Experience Gives Answers

Why was it that in some 500 million transactions, the public paid during the fiscal year 1942, over thirty-three million dollars ($33,417,366.68) for air mail service when it could have had railway mail services for less than one-half that amount?

Why did the public pay over nine million dollars ($9,036,380.78) for air express transportation in 1942 when it could have had rail express service for about one-fifth of that amount?

Why did the public pay for rail express service in 1942 about two hundred and forty million dollars when it could have had rail freight service for about one-half of that amount?

Why has the Illinois Central Railroad moved millions of dollars of rail freight traffic between Chicago and New Orleans when much of it could have been moved at lower rates on barges operated on the Mississippi River?

Obviously, the answer is speed and service. How will all of America get this advantage? It can be had through the coordination of air and ground transportation and through the establishment of secondary and feeder routes. Costly?

Yes, but so was the automobile and truck when compared to the horse-drawn vehicle.

The Expansion Ahead

Just as there will be great air expansion in this country, so also will there be expansion of world air routes and routes to Alaska and to other territories and within them. All planes operated on such routes will carry cargo, much of it originating within or destined to the interior of the continental United States, contributing to the volume which will be carried on domestic air transportation routes.

The planes to come in the future will permit of further reduction in rates. Of all of the thousands and thousands of planes the United States has produced none have been built to date with a view of permitting primary route carriers to provide the most economical air cargo service possible. Planes have been a compromise either to passengers or to some foreign problem or to Army conditions. Passenger planes necessitate the carrying of much dead weight for the comfort of patrons—food, sound proofing, heating, super-safety devices, etc. Comparatively little has been done to develop engine or fuel economy. All of these problems will be tackled and downed to give us an all-cargo plane which will operate at much lower costs than at present.

Undoubtedly the helicopter will find its place in the picture, perhaps in feeder or taxi type of service. It seems to be admirably adapted for this type of service in metropolitan districts of the larger cities. The more orthodox hovering type of plane which can land and take off from very small airports cannot be counted out of the taxi feeder service.

Through a coordination of schedules, the feeder and combination planes and special type aircraft will transfer their cargo to the all cargo trips at strategic points.

FLYING FREIGHT CAR—One of the new "Cargoliners" with which United Air Lines has inaugurated a coast-to-coast all-cargo schedule for essential war-time mail and express. The planes are Douglas DC-3s, which have been stripped of passenger furnishings and equipped with such special cargo features as plywood floors, plywood siding, steel screened windows and cargo bins. They carry three tons of cargo as compared with the average 1,400 pounds transported aboard one of United's regular passenger-cargo liners.

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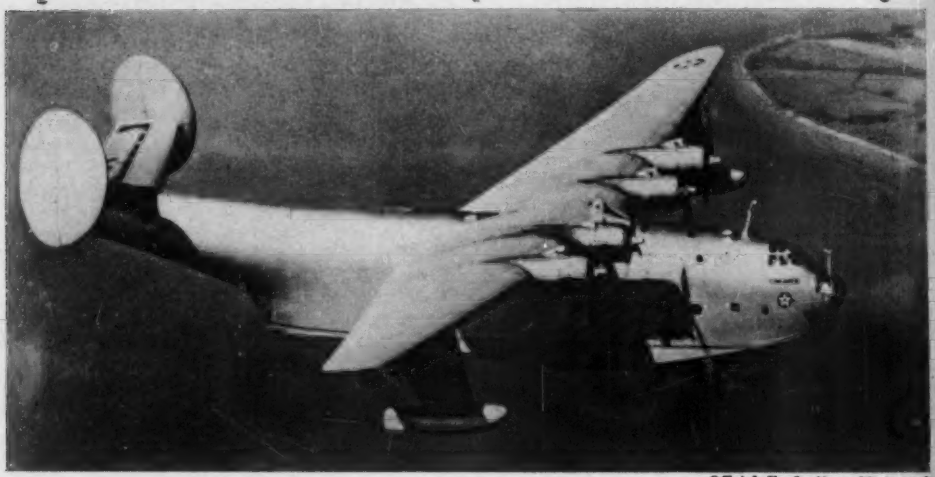
AIR-PORTATION NEWS

(TRADE MARK REGISTERED)

Navy's Martin Mars Sets All-Time World Record As Cargo Carrier



Official U. S. Navy Photograph

THE Navy's cargo-carrying flying boat *Mars*, long-heralded biggest flying boat in the world [AIR TRANSPORTATION, *June, 1943*], made history this month on its first big war job.

Flying from the Patuxent, Md., Naval Air Station, the *Mars* hauled Christmas mail for the Armed Forces overseas and war freight on a round trip that took it to Belem, Brazil, and back via Trinidad and Bermuda.

On the takeoff from Patuxent, the big ship lifted aloft the biggest weight ever pulled off the ground by a plane: 74.25 tons, including its own weight and that of its fuel and cargo. The plane itself weights an even 36 tons.

Cargo to Brazil included only 6.5 tons of Christmas mail, but it was a long non-stop flight, increasing weight of fuel that had to be carried. The 4,375-mile hop was made in 28 hours, 25 minutes, at 152 miles an hour, with a crew of 16 manning the ship, under command of Lieut. Comdr. William E. Coney, 37, of Baltimore, former Eastern Air Lines pilot.

From Natal, first stop, she took 11.5 tons of cargo to Belem. From Belem to Port of Spain, Trinidad, she carried the biggest cargo payload ever taken off the ground, 17.5 tons of war material. From Port of Spain to Bermuda, the load was 11.5 tons again, and from Bermuda back home to Patuxent, just under 14 tons. Cargo hauled during the trip included such raw materials of war as steatite, tantalite, mica and beryllium.

The *Mars* was accepted by the Navy a few days before the flight. Capt. Donald Smith, commanding the Naval Air Transport Service, ordered it to be "rushed into war service" to test her worth. Its total time out on the maiden trip would have been cut sharply, it was stated, except that vital tests were conducted at each stop.

The *Mars* has a wing span of 200 feet. Its engines deliver 2,200 horsepower each. More than twice the weight of a Flying Fortress, the *Mars* originally was intended to be patrol bomber.

PC Lines Reveal Cargo Carrying for Army Air Posts

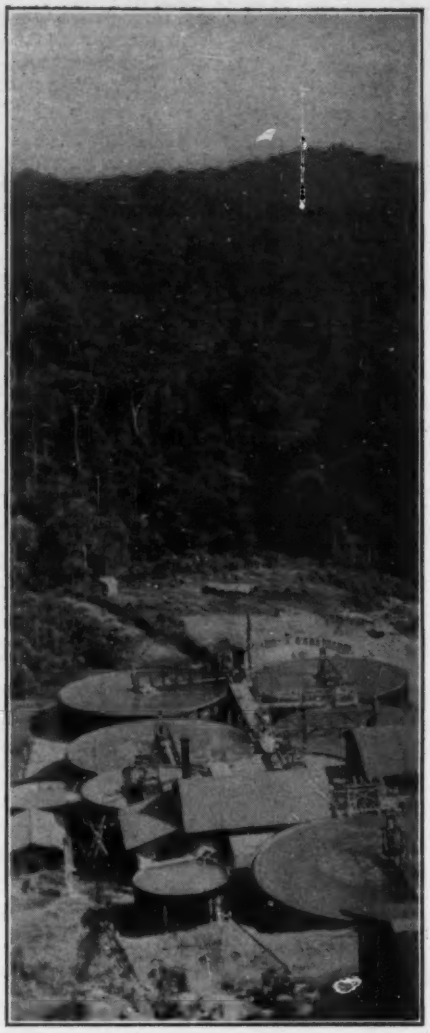
Working under the Air Transport Command, twenty pilots of the Pennsylvania-Central Airlines aid in the work of getting cargoes to a network of Army bases west and south of Washington. With these pilots in command, Pennsylvania-Central cargo planes are also used to train Army pilots for the work of flying Army cargo ships. These Army pilots fly as co-pilots and observers. In addition, some Marine fliers were similarly trained last fall.

The Pennsylvania-Central military transport organization was set up and operations started on April 1, 1942, under the direction of the Air Service Command, headed by Maj. Gen. Henry J. F. Miller, which had charge of all activities now handled by the ASC and the Air Transport Command.

The first operation consisted of a circle trip from Washington to Middletown, Dayton, Ohio; Nashville, Tenn.; Mobile, Ala.; Tampa, Fla.; Savannah, Ga.; Charlotte, N. C.; Norfolk, Va., and Washington. A few weeks later, with the conversion of additional planes taken from commercial operations and leased to the Army, a flight was started in the opposite direction on the same circle.

Later, three round trips a day to Miami from Washington were included in the service, and this soon will be increased to four. During this time various schedules have been in effect and at one time or another stops have been made at the following cities or bases: Richmond, Va.; Wilmington, N. C.; Fort Bragg, N. C.; Columbia, S. C.; Greenville, S. C.; Charleston, S. C.; Augusta, Ga.; Macon, Ga.; Montgomery, Ala.; Birmingham, Ala.; Jackson, Miss.; Elgin Field, Fla.; and Orlando, Fla. Also in operation now is a daily flight to New Orleans. One plane has been lost.

Not all of the Air Transport Command operations of Pennsylvania-Central have been routine cargo route carrying. There have been special missions. One which may now be revealed took fifteen crews to Alaska for operations that were completed in a month over a route from Edmonton, Canada, through White Horse and Fairbanks to Nome in far western Alaska. Another mission found PCA planes operating from Maine northward.



GOLD FIELD — Washing tanks, every scrap of which was flown in to this isolated jungle mine from the coast by the Central American TACA line.

Goodyear to Build $2,500,000 Hangar

A $2,500,000 flight hangar and service shops for the Goodyear Aircraft Corporation at Akron, Ohio, will be built by the George A. Fuller Company of New York.

Financed by the Defense Plant Corporation, the thirty-five-foot high hangar will be used for the servicing of Corsair fighter planes

The State Department To Work with CAB for Post-War Air Program

THE State Department will deal with foreign Governments in seeking new landing rights abroad for aviation companies but in doing so will collaborate with the Civil Aeronautics Board, a joint statement by the department and the board has declared.

The statement was intended to clarify for the aviation industry and the public the respective interests of the two agencies in the development of international air transportation services. It stressed that they would cooperate closely and was considered important as pointing to the procedure that would be followed in aviation after the war.

Foreign companies seeking landing rights in this country, it was announced, should request their Governments to forward their applications through diplomatic channels.

The joint statement stressed these points:

"The Department of State has a primary interest in the subject from the standpoint of foreign policy and international relations, including the broad economic effects of aviation in foreign countries.

"The Civil Aeronautics Board is charged with the responsibility, within the framework and guided by the policies of applicable legislation, of developing policy with respect to the organization and functioning of civil air transportation.

"Determination of route and the like are matters for decision by the board," the statement continued, "though the Department of State may bring to the attention of the board considerations and facts relating to foreign policy which may be relevant to the subject-matter of any determination in respect of which the department is consulted or may have an interest based on consideration of foreign relations."

The facilities of each are freely available to the other.

In the development of new international air services the statement thus explained the procedure being followed:

Applications for certificates of public convenience and necessity, and amendments thereof, are filed with the Civil Aeronautics Board.

The board forwards copies of such applications to the Department of State for information, and such comment as it may wish to make to the board.

Applications from foreign air carriers will be received in the Department of State and immediately transmitted to the Civil Aeronautics Board, with which thereafter the applicant will prosecute his application directly.

(TRADE MARK)

Denver-K. C. Air Link To Open Early in '44

Continental Air Lines plans to begin service over its Denver-Kansas City route "shortly after the first of the year." Terrell C. Drinkwater, executive vice-president, reports that the exact date of its inauguration of the service depends on negotiations with the Army.

CAL has taken delivery on a 14-passenger Lockheed *Lodestar*, in preparation for service on the Denver-Kansas City run. The plane was one of those sold to the Army when the line turned over half of its equipment to the military in June 1942. Plans call for one round-trip daily between Denver and Kansas City, via Salina and Topeka, Kans. Additional schedules—looking toward three round trips daily—are to be added as aircraft become available.

With the *Lodestars*, which are said to give Continental the fastest block-to-block schedules of any airline in the country, flying time from Denver to Kansas City will be about three hours and 30 minutes compared with the present five hours and 32 minutes via Wichita, Kans., and five hours and 42 minutes via Omaha.

AIR COMMERCE NOTES

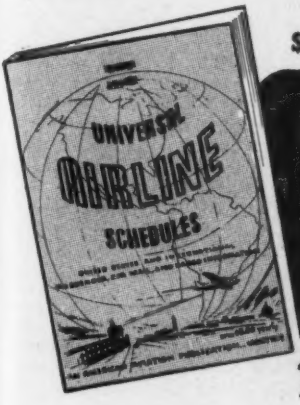
American Airlines in the nine months ending Sept. 30, showed increases in all three departments of its business, with the greatest improvement in mail and cargo. Mail pound-miles were 11,621,025,676 in 1943 as compared to 6,175,258,313 in 1942, and in air cargo AA flew 7,212,695,308 pound-miles as compared to 4,103,610,999 in 1942. Mail Revenue was up 45.3% and Express Revenue increased 76.0% over last year.

* * *

Northwest Airlines planes again stepped up cargo service in October, carrying war supplies a total of 96,973,821 express pound-miles during the month, a new all-time high. Cargo for the month was 147,558 pounds, mostly war materials transported to military and production centers on NWA between Chicago and Seattle.

* * *

Carrying priority express and passengers, American Airlines, Inc., has resumed service to Palm Springs, Calif. This is the first time since 1936 that Palm Springs has had commercial plane service. At that time American Airlines' Flagships landed there on the Southern Transcontinental route. The new service is being inaugurated to take care of the heavy movements of military personnel and cargo to and from Palm Springs.



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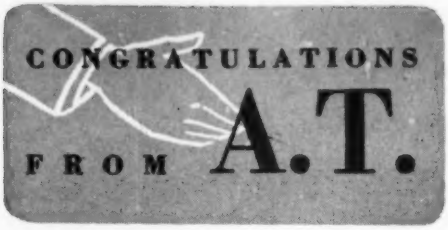

TO William Taylor, holder of executive positions with various mining and manufacturing enterprises in this country and Latin America, who has been elected president of Lineas Aereas Mineras S.A. of Mexico, according to announcement by W. A. Patterson, president of United Air Lines. United recently acquired a controlling interest in LAMSA, which operates through central Mexico.

William Taylor

Taylor, a native of Ohio, is well known in Cleveland, Denver and Los Angeles where he has had business connections. He spent over nine years in Panama on government engineering projects and has had extensive experience in Latin American countries. His headquarters will be in Mexico City.

TO H. Delaney Dilworth, who has joined United Air Lines at its Chicago general offices as a rate and tariff analyst. According to C. P. Graddick, director of United's air cargo department, the position is the first of its kind in the air transportation field, created in view of the steadily increasing volume of war-time air shipments and the corresponding need for accurate, up-to-date information on rates and tariffs.

H. D. Dilworth

Mr. Dilworth, a graduate of the University of Alabama in 1935, joined the Tennessee Valley Authority as assistant traffic analyst in 1937. He remained with TVA until 1941 when he entered the Transportation Division, Transportation & Warehousing Branch of the U. S. Department of Agriculture at Washington as a specialist in economics.

TO William F. McGrath, formerly Eastern Regional traffic manager for Transcontinental & Western Air, Inc., who has been promoted to system traffic superintendent, with headquarters in Kansas City, Mo. The appointment was announced in Kansas City by V. P. Conroy, vice-president in charge of traffic.

Wm. F. McGrath

McGrath's new post was recently created by TWA as part of a program to effect wider distribution of veteran airline traffic personnel at key stations along the coast-to-coast system. This program will further expedite the heavy flow of war cargo, air mail and passenger traffic, Conroy said.

McGrath has been traffic manager for the Eastern region for the past four years, with headquarters in New York City. Internationally known in the transportation industry, he began his career in the steamship business in New York in 1911 when he went to work for the Anchor Line. McGrath remained with the line until 1917 when he joined the United States Navy and served during the World War.

Shortly after the war he joined Thomas Cook & Son in New York as a cruise director assistant and in 1927 became manager of the Baltimore office of the organization and, subsequently, manager of their Philadelphia office. In 1935 he rejoined the Anchor Line as passenger traffic manager and in 1939 was made general manager for the United States and Canada, the highest post in the line in this country. He joined TWA in April, 1940, as eastern manager of traffic and sales.

A former resident of Brooklyn, N. Y., McGrath now lives in Rockville Centre, L. I., with his wife and four children.

TO James P. Stuart, promoted from reservations supervisor for Transcontinental & Western Air, Inc. in Kansas City, to district traffic manager at Phoenix, Ariz. Employed by TWA in June of 1940 as traffic representative at Los Angeles, Stuart also has served as a member of the Public Information Department and as employment supervisor of the airline personnel department in Kansas City.

Phoenix will be linked to the trunkline system of TWA Oct. 1, when the airline will add that Army air center as a regular stop on two round trip transcontinental flights daily.

TO William V. Brown of Waltham, Mass., named as assistant director of post-war planning for Northeast Airlines. In anticipation of route expansions throughout the New England Territory and into New York state, Brown will work on a program for a helicopter service to include a pickup and delivery of air mail and air express over 400 communities.

Brown, who for 34 years was employed in the Railway Mail branch of the U. S. Post Office in Boston, has had wide technical experience in this field, having initiated the makeup and dispatch of the first air mail schedules for this branch of the postal service in New England.

TO Thomas W. S. Davis, named area manager for United Air Lines' air cargo department at Washington in recognition of the increasing importance of air mail and air express moving in and out of the national capital over United's system since the company inaugurated service to Washington. Mr. Davis at one time was secretary to the Postmaster General in Washington, D. C., and, prior to that, assistant to the chairman of the National Democratic Committee.

T. W. S. Davis

TO Lorenzo L. Snow on his appointment as manager of the airport division of United Aircraft Corporation. Mr. Snow, who has been Washington representative of Pratt & Whitney Aircraft division of United Aircraft since 1938, assumes the post in the airport division made vacant when Bernard L. Whelan was named General Manager of Sikorsky Aircraft at Bridgeport.

Lorenzo L. Snow

Mr. Snow is a veteran pilot, receiving his first flight instruction from Arch Hoxie in 1911. He had his Army flying instruction at Mineola Field, L. I., in 1917. During World War I he went to France and England as an engineering flying officer. Later he served in various posts in this country and at Luke Field, Pearl Harbor. He resigned as a Captain in 1926 to enter the private aircraft business—operating an airport in California before joining Pratt & Whitney Aircraft in February 1934 as an installation engineer.

Four years later Mr. Snow was sent to California as assistant West Coast Representative of P&WA and was transferred to Washington in December 1938.

TO A. D. "Don" Williams, Jr., on his appointment as New York district traffic manager for Transcontinental & Western Air, Inc. Mr. Williams will have charge of all traffic functions for TWA in the local area, with headquarters in the Airlines Terminal Building, New York City. He succeeds Lee Swigart, recently promoted to Eastern Regional Traffic Manager.

A. D. Williams

Born in uptown Manhattan, Williams grew up in Scarsdale, N. Y., and attended Scarsdale High School, the Hackley School in Tarrytown, and Columbia University, from which he was graduated with a B.A. degree. He was captain of the Columbia golf team in 1928.

He now lives in Hartsdale, N. Y., and is a member of the Town Club of Scarsdale, the National Aeronautical Association, the Forest Lake Club and Psi Upsilon.

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(TRADE MARK)

Airport Bigger Than La Guardia Serves Army on Bulge of Brazil

ONE of the mightiest air bases in the world, hacked from desolate wilderness in less than a year by the cooperative effort of Brazil and the U. S., has been playing a vital role in bringing Allied victory ever closer.

The vast Parnamirim air station, 15 miles from Natal on Brazil's northeastern bulge, was built under an agreement signed between the two republics. Before 12 months, a harsh, lonely wilderness had been converted into a huge, sprawling city of runways, hangars, shops, living quarters and all other installations needed to keep an airport larger than New York's La Guardia Airport functioning on a wartime basis.

The mammoth port quickly became the chief funnel through which thousands of battle planes and transports passed to fly the Atlantic at its narrowest point, an important base for anti-submarine air patrols.

How important Parnamirim has been to the defense of the whole American Continent was expressed by President Roosevelt, General George C. Marshall and other Allied leaders when they acknowledged Brazil's contribution to the huge project. They have readily admitted that the African and Sicilian victories, the invasion of Italy and the resulting downfall of Mussolini might never have been possible without Parnamirim. And Parnamirim is still growing.

N. Y. Port Authority Looks to Air Future

AIRPORTS have become the concern of the Port of New York Authority with the addition to the authority's staff of John Walter Wood, author of *Airports*, and the launching of thorough-going studies in the air transport terminal field.

Wood recently made studies for the Department of Commerce and has been aviation consultant for Government agencies and airlines, aircraft companies and technical schools of the Army Air Forces.

In announcing the new undertakings of the Port Authority, Frank C. Ferguson, the chairman, said:

"The port of New York should be the major terminal for transatlantic air transport. Logic dictates that the major overseas services must make New York their terminus. Within the metropolitan areas and the territory it serves originates the great preponderance of high-class passenger and freight traffic which will support fast, frequent and direct flights in overseas air service.

"In addition to large central airports," Mr. Ferguson said, "we believe there will be need for numerous secondary airports throughout the port district. There should also be developed a series of off-line union stations through which will function a coordinated system of pick-up and delivery for air freight and passengers. These will be in the principal business centers and will be linked with the airports by fast highway transport and perhaps helicopters."

The Authority's planning division is estimating air traffic potentials in relation to existing and proposed air routes and airports. Studies are being made of the pick-up and delivery problems of air commerce. The Authority also is assembling, for presentation at Civil Aeronautic Board hearings, data on applications for airline routes to and from the port area.

Out of the Frying Pan Into the Arctic

Two Pan American Airways assistant airport managers in Natal, Brazil, have been transferred as junior airport managers to the Alaska Division, more than 7,000 miles away.

From the warm tropics at Natal to the sub-Arctic at Whitehorse goes Dean Miller, while John Morse will be stationed at Anchorage. Both are now at their new posts.

(TRADE MARK)

International Express and Mail Tables

Express rates quoted are from U. S. international airport of departure and are based on the latest prevailing tariffs. Shippers are warned, however, that they are subject to change.

Bro—Brownsville, Tex.
Bw—Boston, Mass.
Cg—Chicago
Cub—Cut Bank, Mont.
Eo—El Paso
Fv—Fort Worth
Gf—Grand Forks, N. D.
Lgs—Los Angeles
Mia—Miami
No—New Orleans
Nyk—New York
Sq—San Diego
Ste—Seattle

International Air Express is subject to two charges: one a charge per pound weight or measurements at carrier's option (200 cu. in. to the pound of weight), the other a charge per $100 of valuation. The two must be added on any shipment to determine the cost. Neither includes insurance, which may be purchased by the shipper from the carrier or otherwise.

Priorities: The air carriers warn all shippers that express traffic, both U. S. Government and commercial, is so heavy that no guarantee can be given that any shipment will depart on any particular plane unless it enjoys U. S. priority. Otherwise it will depart in relation to other shipments, in the order received at the international airport used, subject to wartime limitations. Shippers should forward cargo to international airports as far in advance of desired departure as possible and should communicate **via Railway Express Agency, Inc.** with the international air carrier as to whether the shipment can be forwarded without priority, as shipments without priority for certain countries are, at present, under embargo. (On cargoes to be shipped via American Export Airlines, Inc., shippers should inquire at their office, Room 920, 25 Broadway, New York.)

International air carriers whose schedules and rates are included here are indicated by the letter following the symbol for the airport:

A—American Airlines.
C—Colonial Air Lines.
E—American Export Airlines.
EA—Express Aero Inter-Americano, S. A.
K—KLM-Royal Dutch Air Lines.
NE—Northeast Airlines.
NW—Northwest Airlines, Inc.
P—Pan American Airways System and affiliates.
T—Trans-Canada Air Lines.
U—United Air Lines.
W—Western Air Lines.

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Antilla, Cuba	Mia P	.24	.25	Dly	.10
Antofagasta, Chile	Mia P	1.26	.50	M,W,Th,F, Sa	.40
"	No P	1.34	.50	Su,Tu,F	.40
"	Bro P	1.34	.50	Tu,W,Th,F, Su	.40
"	Lgs P	1.95	.50	M,Tu,W,Th, F,Sa	.40
Aracaju, Brazil	Mia P	1.26	.50	Su, W	.40
"	No P	1.71	.50	Su,Tu,F	.40
"	Bro P	1.71	.50	M,F	.40
"	Lgs P	2.28	.65	Su,Th	.40
Areia Branca, Brazil	Mia P	1.24	.50	Su	.40
"	No P	1.56	.50	Su	.40
"	Bro P	1.56	.50	F	.40
"	Lgs P	2.13	.50	Th	.40
Arequipa, Peru	Mia P	1.23	.50	Dly	.30
"	No P	1.26	.50	Su,Tu,F	.40
"	Bro P	1.26	.50	Dly	.30
"	Lgs P	1.93	.50	Dly	.30
Arica, Chile	Mia P	1.25	.50	M,W,Th,Sa	.40
"	No P	1.26	.50	Su,Tu,F	.40
"	Bro P	1.26	.50	Tu,W,Th,F, Su	.40
"	Lgs P	1.94	.50	M,Tu,W,Th, Sa	.40
Aruba, N. W. I.	— P	via M	aracaibo, Ven.		...
"	Mia K	.73	.45*	We,Sa	.25
Asuncion, Para	Mia P	1.73	.50	Su,F	.40
"	No P	1.86	.50	Tu,F	.40
"	Bro P	1.86	.50	W,F	.40
"	Lgs P	2.43	.65	Tu,Th	.40
Bahia, Brazil (*See Sao Salvador*)					
Balboa, Canal Zone	Mia P	.76	.40	Dly	.15
"	No P	.90	.40	Su,Tu,F	.15
"	Bro P	.90	.40	Dly	.15
"	Lgs P	1.45	.50	Dly	.15
Baracoa, Cuba	Mia P	.28	.25	Dly ex Sa	.10
Barcelona, Venezuela	Mia P	.85	.40	Dly	.25
"	No P	1.16	.50	Su,Tu,F	.25
"	Bro P	1.17	.50	Dly	.25
"	Lgs P	1.78	.50	Dly	.25
Barranquilla, Colombia	Mia K	.84	.50*	Sa	.35
via Kingston	Mia P	.61	.40	Su,Tu,W,F	.35
via Balboa	Bro P	1.03	.40	Dly	.35
"	No P	1.59	.50	Dly	.35
"	Lgs P	1.03	.40	Tu,Th,Sa	.35
Bauru, Brazil	Mia P	1.58	.50	Su	.40
"	No P	1.71	.50	F	.40
"	Bro P	1.71	.50	F	.40
"	Lgs P	2.28	.65	Th	.40

Destination	U. S. Gateway & Airline	RATES		Depart	Mail per ½ Oz.
		Per Lb.	Per $100 Value		
Belem, Brazil (*See Para*)	.....	.....	.....	.....	.....
Bello-Horizonte, Brasil	Mia P	1.65	.50	Su,M,W,F	.40
"	No P	1.03	.40	Tu,Th,Sa	.35
"	Bro P	2.13	.50	M,W,F,Su	.40
"	Lgs P	2.69	.65	Su,Tu,Th,F	.40
Bonaire, N. W. I.	— P	via M	arac	aibo, Ven.	
"	Mia K	.77	.45*	We,Sa	.25
Buenos Aires, Argentina	Mia P	1.56	.50	Dly	.40
"	No P	2.13	.50	Su,Tu,F	.40
"	Bro P	1.70	.50	Dly	.40
"	Lgs P	2.26	.65	Dly	.40
Cali, Col. via Balboa	Mia P	.89	.40	Dly	.35
"	No P	1.70	.50	Su,Tu,F	.40
"	Bro P	1.03	.40	Dly	.35
"	Lgs P	1.59	.50	Dly	.35
Camaguey, Cuba	Mia P	.26	.25	Dly	.10
"	Mia K	0.23	.25*	We,Sa	.10
Camocim, Brazil	Mia P	1.22	.50	.....	.40
"	No P	1.50	.50	.....	.40
"	Bro P	1.50	.50	.....	.40
"	Lgs P	2.05	.50	.....	.40
Campeche, Mexico	Mia P	.41	.25	Su,W,F	.10
"	No P	.41	.25	Su,Tu,F	.10
"	Bro P	.51	.40	Dly	.10
"	Lgs P	1.00	.40	Dly	.10
Campo Grande, Brasil	Mia P	1.48	.50	Su,F	.40
"	No P	1.61	.50	Su,Tu	.40
"	Bro P	1.61	.50	W,F	.40
"	Lgs P	2.18	.50	Tu,Th	.40
Canavieiras, Brazil	Mia P	1.33	.50	Su,W	.40
"	No P	1.81	.50	Su,Tu,F	.40
"	Bro P	1.81	.50	M,F	.40
"	Lgs P	2.38	.65	Su,Th	.40
Caracas, Venezuela (*See La Guaira*)	.....	.....	.....	.....	.....
Caravellas, Brasil	Mia P	1.36	.50	Su,W	.40
"	No P	1.85	.50	Su,F	.40
"	Bro P	1.85	.50	M,F	.40
"	Lgs P	2.41	.65	Su,Th	.40
Cayenne, Fr. Guiana	Mia P	1.02	.40	Dly	.30
"	No P	1.26	.50	Su,Tu,F	.30
"	Bro P	1.26	.50	Th	.30
"	Lgs P	1.91	.50	W	.30
Cayo Mambi, Cuba	Mia P	.26	.25	Dly ex Sa	.10
Chetumal, Mexico	Mia P	.55	.40	W,F	.10
"	No P	.55	.40	Su,Tu	.10
"	Bro P	.55	.40	Su,Th	.10
"	Lgs P	1.04	.40	W,Sa	.10
Chiclayo, Peru	Mia P	1.11	.50	Dly	.30
"	No P	1.19	.50	Su,Tu,F	.30
"	Bro P	1.19	.50	Dly	.30
"	Lgs P	1.81	.50	Dly	.30
Cienfuegos, Cuba	Mia P	.28	.18	Su,Tu,F	.10
C. del Carmen, Mexico	Mia P	.45	.25	Su,W,F	.10
"	No P	.45	.25	Su,Tu,F	.10
"	Bro P	.47	.40	Dly	.10
"	Lgs P	.94	.40	Dly	.10
Ciudad Trujillo, D. R.	Mia P	.45	.25	Dly	.10
"	Mia K	1.11	.50*	Sa	.10
Cochabamba, Bolivia	Mia P	1.26	.50	W,Sa	.35
"	No P	1.35	.50	Tu,F	.35
"	Bro P	1.35	.50	Tu,F	.35
"	Lgs P	1.95	.50	M,Th	.35
Concepcion, Bolivia	Mia P	1.31	.50	Sa	.35
"	No P	1.45	.50	?	.35
"	Bro P	1.45	.50	F	.35
"	Lgs P	2.03	.50	Th	.35
Cordoba, Argentina	Mia P	1.49	.50	Dly	.40
"	No P	1.63	.50	Su,Tu,F	.40
"	Bro P	1.63	.50	Dly	.40
"	Lgs P	2.19	.50	Dly	.40
Coro, Venezuela	Mia P	.74	.40	Su,Tu	.25
"	No P	1.11	.50	Su,Tu,F	.25
"	Bro P	1.11	.50	Dly	.25
"	Lgs P	1.69	.50	Dly	.25
Corumba, Brasil	Mia P	1.41	.50	Su,W,F,Sa	.40
"	No P	1.56	.50	Tu,F	.40
"	Bro P	1.56	.50	M,Th	.40
"	Lgs P	2.13	.50	S,W	.40
Cristobal, Canal Zone	Mia P	.76	.40	Dly	.15
"	No P	.92	.40	Su,Tu,F	.15
"	Bro P	.92	.40	Dly	.15
"	Lgs P	1.46	.50	Dly	.15

Destination	U. S. Gateway & Airline	RATES		Depart	Mail per ½ Oz.
		Per Lb.	Per $100 Value		
Cuenca, Ecuador	Mia P	1.06	.40	Su,W,F	.30
"	No P	1.15	.50	Tu,F	.30
"	Bro P	1.15	.50	Tu,Th,Sa	.30
"	Lgs P	1.76	.50	M,W,F	.30
Curacao, N. W. I.	— P	via M	arac	aibo, Ven.	
"	Mia K	0.75	.45*	We, Sa.	.25
Curityba, Brazil	Mia P	1.60	.50	Su,W,F	.40
"	No P	2.00	.50	Su,Tu,F	.40
"	Bro P	2.00	.50	M,W,F	.40
"	Lgs P	2.58	.65	Su,Tu,Th	.40
David, Panama	Mia P	.82	.40	Dly	.15
"	No P	.85	.40	Su,Tu,F	.15
"	Bro P	.85	.40	Dly	.15
"	Lgs P	1.38	.50	Dly	.15
Esmeraldas, Ecuador	Mia P	.99	.40	Tu	.30
"	No P	1.11	.50	Su	.30
"	Bro P	1.11	.50	M	.30
"	Lgs P	1.71	.50	Su	.30
Florianopolis, Brasil	Mia P	1.63	.50	Su,M,F	.40
"	No P	2.11	.50	Tu,F	.40
"	Bro P	2.11	.50	W,F,Sa	.40
"	Lgs P	2.68	.65	Tu,Th,F	.40
Fort de France, Martinique	Mia P	.71	.40	Sa	.15
"	No P	1.00	.40	Su	.15
"	Bro P	1.16	.50	Su	.15
"	Lgs P	1.78	.50	Sa	.15
Fortaleza, Brazil (Ceara)	Mia P	1.23	.50	Su,M,Tu,W,Th,Sa	.40
"	No P	1.54	.50	Su,Tu,F	.40
"	Bro P	1.54	.50	Su,M,Tu,Th,F,Sa	.40
"	Lgs P	2.10	.50	M,W,Th,F,Sa	.40
Georgetown, British Guiana	Mia P	.90	.40	Dly	.30
"	No P	1.24	.50	Su,Tu,F	.30
"	Bro P	1.24	.50	Dly	.30
"	Lgs P	1.88	.50	Dly	.30
Guadalajara, Mexico	Bro P	.43	.25	Dly	.10
"	Lgs P	.59	.40	Dly	.10
Guantanamo, Cuba	Mia P	.28	.25	Dly	.10
Guatemala City, Gua	Mia P	.74	.40	Dly	.12
"	No P	.53	.40	Su,Tu,F	.12
"	Bro P	.53	.40	Dly	.12
"	Lgs P	1.08	.50	Dly	.12
Guayaquil, Ecuador	Mia P	1.04	.40	Dly	.30
"	No P	1.15	.50	Su,Tu,F	.30
"	Bro P	1.15	.50	Dly	.30
"	Lgs P	1.75	.50	Dly	.30
Havana, Cuba	Mia P	.20	.18	Dly	.10
"	MiaEA	.20	.18	Dly	.10
Hermosillo, Mexico	Bro P	.77	.40	Dly	.10
"	Lgs P	.24	.25	Dly	.10
Iguassu Falls, Brasil	Mia P	1.69	.50	Su,F	.40
"	No P	1.91	.50	Tu,F	.40
"	Bro P	1.91	.50	W,F	.40
"	Lgs P	2.48	.65	Tu,Th	.40
Ixtepec, Mexico	Mia P	.76	.40	Su,W,F	.10
"	No P	.76	.40	Su,Tu,F	.10
"	Bro P	.41	.25	Su,M,Tu,W,Th,F	.10
"	Lgs P	.89	.40	Su,M,Tu,W,Th,Sa	.10
Joao Pessoa, Brazil (Cabedello)	Mia P	1.25	.50	W	.40
	No P	1.64	.50	Su	.40
	Bro P	1.64	.50	M	.40
	Lgs P	2.20	.50	Su	.40
Kingston, Jamaica	Mia P	.39	.25	Su,Tu,W,F	.10
"	Mia K	0.34	.35*	We	.10
La Guaira, Venezuela	Mia P	.81	.40	M,W,F,Sa	.25
"	Mia K	0.75	.45*	We,Sa	.25
"	No P	1.15	.50	Su,Tu,F	.25
"	Bro P	1.15	.50	Dly	.25
"	Lgs P	1.75	.50	Dly	.25
La Paz, Bolivia	Mia P	1.25	.50	Su,Tu,W,Sa	.35
"	No P	1.30	.50	Su,Tu,F	.35
"	Bro P	1.30	.50	M,Tu,F,Sa	.35
"	Lgs P	1.95	.50	Su,M,Th,F	.35
Lima, Peru	Mia P	1.18	.50	Dly	.30
"	No P	1.24	.50	Su,Tu,F	.30
"	Bro P	1.24	.50	Dly	.30
"	Lgs P	1.88	.50	Dly	.30

Destination	U. S. Gateway & Airline	RATES		Depart	Mail per ½ Oz.
		Per Lb.	Per $100 Value		
Loja, Ecuador	Mia P	1.08	.50	Su,W,F	.30
"	No P	1.17	.50	Tu,F	.30
"	Bro P	1.17	.50	Tu,Th,Sa	.30
"	Lgs P	1.78	.50	M,W,F	.30
Maceio, Brazil	Mia P	1.26	.50	Su,M,Tu,W, Th,Sa	.40
"	No P	1.68	.50	Su,Tu,F	.40
"	Bro P	1.68	.50	Su,M,Tu,Th, F,Sa	.40
"	Lgs P	2.24	.50	M,W,Th,F, Sa	.40
Managua, Nicaragua	Mia P	.86	.40	Dly	.12
"	No P	.71	.40	Su,Tu,F	.12
"	Bro P	.71	.40	Dly	.12
"	Lgs P	1.22	.50	Dly	.12
Manaos, Brazil	Mia P	1.24	.50	Su,W	.40
"	No P	1.56	.50	Tu,F	.40
"	Bro P	1.56	.50	M,F	.40
"	Lgs P	2.13	.50	Su,Th	.40
Manta, Ecuador	Mia P	1.03	.40	Th,Sa	.30
"	No P	1.14	.50	Tu,F	.30
"	Bro P	1.14	.50	W,F	.30
"	Lgs P	1.74	.50	Tu,Th	.30
Manzanillo, Cuba	Mia P	.26	.25	Dly ex Su	.10
Maracaibo, Venezuela	Mia P	.69	.40	Su,Tu	.25
"	Mia K	.80	.45*	We,Sa	.25
"	No P	1.08	.50	Su,Tu,F	.25
"	Bro P	1.08	.50	Dly	.25
"	Lgs P	1.66	.50	Dly	.25
Maturin, Venezuela	Mia P	.89	.40	Dly	.25
"	No P	1.19	.50	Su,Tu,F	.25
"	Bro P	1.19	.50	Dly	.25
"	Lgs P	1.80	.50	Dly	.25
Mazatlan, Mexico	Bro P	.57	.40	Dly	.10
"	Lgs P	.45	.25	Dly	.10
Medellin, Colombia (via Barranquila)	Mia P	1.06	.40	Su,Tu,W,F	.35
Medellin, Colombia (via Balboa)	Mia P	1.06	.40	Sa	.35
"	No P	1.10	.50	Tu,Th,Sa	.35
"	Bro P	1.10	.50	M,Th,F	.35
"	Lgs P	1.65	.50	Su,W,Th	.35
Mendoza, Argentina	Mia P	1.41	.50	M,W,Th,Sa	.40
"	No P	1.55	.50	Su,Tu,F	.40
"	Bro P	1.55	.50	Su,Tu,W,F	.40
"	Lgs P	2.11	.50	M,Tu,Th,Sa	.40
Merida, Mexico	Mia P	.37	.25	Su,W,F	.10
"	No P	.37	.25	Su,Tu,F	.10
"	Bro P	.55	.40	Dly	.10
"	Lgs P	1.04	.40	Dly	.10
Mexicali, Mexico	Lgs P	.20	.18	Dly	.10
Mexico City, Mexico	Mia P	.64	.40	Su,W,F	.10
"	No P	.64	.40	Su,Tu,F	.10
"	Bro P	.26	.25	Dly	.10
"	Lgs P	.69	.40	Dly	.10
"	Lgs A	.70	.35	Dly	.10
Mexico City, Mexico	Fv A	.40	.25	Dly	.10
"	Eo A	.42	.25	Dly	.10
"	Sq A	.74	.35	Dly	.10
Minatitlan, Mexico	Mia P	.53	.40	Su,W,F	.10
"	No P	.53	.40	Su,Tu,F	.10
"	Bro P	.39	.25	Dly	.10
"	Lgs P	.86	.40	Dly	.10
Monterrey, Mexico	Fv A	.33	.25	Dly	.10
"	Eo A	.34	.25	Dly	.10
"	Lgs A	.62	.35	Dly	.10
"	Sq. A	.74	.35	Dly	.10
Montevideo, Uruguay‡					
Nassau, Bahamas	Mia P	.20	.18	Dly ex Su,W	.10
Natal, Brazil	Mia P	1.25	.50	M,Tu,Th,Sa	.40
"	No P	1.61	.50	Su,Tu,F	.40
"	Bro P	1.61	.50	Su,M,Tu,Th, F,Sa	.40
"	Lgs P	2.18	.50	Su,M,W,Th, F,Sa	.40
Oaxaca, Mexico	Mia P	.73	.40	Su,W,F	.10
"	No P	.73	.40	Su,Tu	.40
"	Bro P	.35	.25	Su,Tu,Th	.10
"	Lgs P	.81	.40	Su,Tu,Th	.10
Oruro, Bolivia	Mia P	1.26	.50	Su,Tu,W,Sa	.35
"	No P	1.33	.50	Su,Tu,F	.35
"	Bro P	1.33	.50	M,Tu,F,Sa	.85
"	Lgs P	1.95	.50	Su,M,Th,F	.85
Panama City, Panama	(See Balboa, C. Z.)				
Para (Belem), Brazil	Mia P	1.13	.50	Dly	.40
"	No P	1.34	.50	Su,Tu,F	.40
"	Bro P	1.34	.50	Dly	.40
"	Lgs P	1.95	.50	Dly	.40
Paramaribo, Sur	Mia P	.97	.40	Dly	.30
"	Mia K	1.20	.60*	Sa	.30
"	No P	1.25	.50	Su,Tu,F	.30
"	Bro P	1.25	.50	Dly	.30
"	Lgs P	1.90	.50	Dly	.30
Parnahyba, Brasil	Mia P	1.21	.50	Su,W	.40
"	No P	1.48	.50	Su,F	.40
"	Bro P	1.48	.50	M,F	.40
"	Lgs P	2.04	.50	Su,Th	.40
Point a Pitre, Guadeloupe	Mia P	.66	.40	Sa	.15
"	No P	.98	.40	Su	.15
"	Bro P	1.14	.50	Su	.15
"	Lgs P	1.74	.50	Sa	.15
Port au Prince, Haiti	Mia P	.37	.25	Dly	.10
"	Mia K	0.39	.35*	Sa	.10
Port of Spain, Trinidad	Mia P	.79	.40	Dly	.15
"	Mia K	1.00	.55*	We,Sa	.15
"	No P	1.20	.50	Su,Tu,F	.15
"	Bro P	1.20	.50	Dly	.15
"	Lgs P	1.81	.50	Dly	.15
Porto Alegre, Brasil	Mia P	1.70	.50	Su,M,W,F	.40
"	No P	2.19	.50	Su,Tu,F	.40
"	Bro P	2.19	.50	M,W,F,Sa	.40
"	Lgs P	2.75	.65	Su,Tu,Th,F	.40
Puerto Suarez, Bolivia	Mia P	1.41	.50	W,Sa	.35
"	No P	1.56	.50	Tu,F	.35
"	Bro P	1.56	.50	Tu,F	.35
"	Lgs P	2.13	.50	M,Th	.35
Preston, Cuba	Mia P	.24	.25	Dly ex Sa	.10
Quito, Ecuador	Mia P	.97	.40	Dly	.30
"	No P	1.09	.50	Su,Tu,F	.30
"	Bro P	1.09	.50	Dly	.30
"	Lgs P	1.68	.50	Dly	.30
Recife (Pernambuco), Brazil	Mia P	1.26	.50	Su,M,Tu,W, Th,Sa	.40
"	No P	1.65	.50	Su,Tu,F	.40
"	Bro P	1.65	.50	Su,M,Tu,W, Th,Sa	.40
"	Lgs P	2.21	.50	Su,M,Tu,W, Th.F.Sa	.40
Rio de Janeiro	Mia P	1.50	.50	Su.M,W,F	.40
"	No P	1.98	.50	Su,Tu,F	.40
"	Bro P	1.98	.50	M,W,F,Sa	.40
"	Lgs P	2.54	.65	Su,Tu,Th,F	.40
Robore, Bolivia	Mia P	1.38	.50	Sa	.35
"	No P	1.51	.50	F	.35
"	Bro P	1.51	.50	F	.35
"	Lgs P	2.08	.50	Th	.35
Salinas, Ecuador	Mia P	1.05	.40	Th,Sa	.30
"	No P	1.15	.50	Tu,F	.30
"	Bro P	1.15	.50	W,F	.30
"	Lgs P	1.75	.50	Tu,Th	.30
Salta, Argentina	Mia P	1.30	.50	Su,Tu,F	.40
"	No P	1.45	.50	Su,Tu,F	.40
"	Bro P	1.45	.50	M,Th,Sa	.40
"	Lgs P	2.03	.50	Su,W,F	.40
San Ignacio, Bolivia	Mia P	1.33	.50	Sa	.35
"	No P	1.48	.50	F	.35
"	Bro P	1.48	.50	F	.35
"	Lgs P	2.04	.50	Th	.35
San Jose, Bolivia	Mia P	1.35	.50	Sa	.35
"	No P	1.50	.50	F	.35
"	Bro P	1.50	.50	F	.35
"	Lgs P	2.08	.50	Th	.35
San Jose, Costa Rica	Mia P	.89	.40	Dly	.15
"	No P	.76	.40	Su,Tu,F	.15
"	Bro P	.76	.40	Dly	.15
"	Lgs P	1.31	.50	Dly	.15

* These rates are only due if consignments are shipped with declared value.

‡ Shipments for Montevideo must be assessed rates to Buenos Aires plus 55c per 2 lbs. or fraction thereof (min. 55c) for forwarding by other carrier to Montevideo, plus $1.10 per shipment transfer charge at Buenos Aires.

Destination	U.S. Gateway & Airline	RATES		Depart	Mail per ½ Oz.
		Per Lb.	Per $100 Value		
San Juan, Puerto Rico	Mia P	53	40	Dly	.10
San Salvador, El Salvador	Mia P	.79	.40	Dly	.12
"	No P	.61	.40	Su,Tu,F	.12
"	Bro P	.61	.40	Dly	.12
"	Lgs P	1.14	.50	Dly	.12
Santa Cruz, Bolivia	Mia P	1.28	.50	W,Sa	.35
"	No P	1.43	.50	Tu,F	.35
"	Bro P	1.43	.50	Tu,F	.35
"	Lgs P	1.99	.50	M,Th	.35
Santiago, Chile	Mia P	1.38	.50	M,W,Th,Sa	.40
"	No P	1.51	.50	Su,Tu,F	.40
"	Bro P	1.51	.50	Su,Tu,W,F	.40
"	Lgs P	2.08	.50	M,Tu,Th,Sa	.40
Santiago, Cuba	Mia P	.26	.25	Dly	.10
Sao Luiz, Brazil	Mia P	1.19	.50	Su,M,Tu,W,Th,Sa	.40
"	No P	1.43	.50	Su,Tu,F	.40
"	Bro P	1.43	.50	Su,M,Tu,Th,F,Sa	.40
"	Lgs P	1.99	.50	Su,M,W,Th,F,Sa	.40
Sao Paulo, Brazil	Mia P	1.55	.50	Su,M,W,F	.40
"	No P	2.04	.50	Su,Tu,F	.40
"	Bro P	2.04	.50	M,W,F,Sa	.40
"	Lgs P	2.60	.65	Su,Tu,Th,F	.40
Sao Salvador, Brazil (Bahia)	Mia P	1.28	.50	Su,M,Tu,W,Th,Sa	.40
"	No P	1.76	.50	Su,Tu,F	.40
"	Bro P	1.76	.50	Su,M,Tu,Th,F,Sa	.40
"	Lgs P	2.33	.65	Su,M,W,Th,F,Sa	.40
St. Johns, Antigua, British West Indies	Mia P	.64	.40	Su,M,W,F,Sa	.15
"	No P	.96	.40	Su,Tu,F	.15
"	Bro P	1.13	.50	Su,M,W,F,Sa	.15
"	Lgs P	1.73	.50	Su,Tu,Th,Sa	.15
St. Thomas, V. I.	Mia P	.57	.40	Sa	.10
"	No P	.90	.40	Su	.10
"	Bro P	1.10	50	Su	.10
"	Lgs P	1.68	.50	Sa	.10
Talara, Peru	Mia P	1.08	.50	Dly	.30
"	No P	1.17	.50	Su,Tu,F	.30
"	Bro P	1.17	.50	Dly	.30
"	Lgs P	1.79	50	Dly	.30
Tampico, Mexico	Bro P	.20	.18	Dly	.10
"	Lgs P	.81	40	Dly	.10
Tapachula, Mexico	Mia P	.74	.40	Su,W,F	.10
"	No P	.74	.40	Su,Tu,F	.10
"	Bro P	.53	.40	Dly	.10
"	Lgs P	1.02	.40	Dly	.10
Tegucigalpa, Honduras	Mia P	.82	.40	Dly	.12
"	No P	.68	.40	Su,Tu,F	.12
"	Bro P	.68	.40	Dly	.12
"	Lgs P	1.18	.50	Dly	.12
Tres Lagoas, Brazil	Mia P	1.53	.50	Su	.40
"	No P	1.66	.50	F	.40
"	Bro P	1.66	.50	F	.40
"	Lgs P	2.23	.50	Th	.40
Tucuman, Argentina	Mia P	1.34	.50	Su,Tu,F	.40
"	No P	1.49	.50	Su,Tu,F	.40
"	Bro P	1.49	.50	M,Th,Sa	.40
"	Lgs P	2.05	.50	Su,W,F	.40
Turbo, Columbia (via Barranquilla)	Mia P	1.06	.40	Su,Tu,W,F	.35
Turbo, Columbia (via Balboa, C. Z.)	Mia P	1.06	.40	Sa	.35
"	No P	1.10	.50	Tu,Th,Sa	.35
"	Bro P	1.10	.50	M,Th,F	.35
"	Lgs P	1.65	.50	Su,W,Th	.35
Tuxpan, Mexico	Bro P	.20	.18	Dly	.10
"	Lgs P	.83	.40	Dly	.10
Tuxtla,Gutierrez,Mexico	Mia P	.81	.40	Su,W,F	10
"	No P	.81	.40	Su,Tu	.10
"	Bro P	.45	.25	Su,Tu,Th	10
"	Lgs P	.93	.40	Su,Tu,Th	10
Uyuni, Bolivia	Mia P	1.26	.50	Su,Tu	.35
"	No P	1.38	.50	Su,F	.35
"	Bro P	1.38	.50	M,Sa	.35
"	Lgs P	1.95	.50	Su,F	.35
Veracrus, Mexico	Mia P	.57	.40	Su,W,F	.10
"	No P	.57	.40	Su,Tu,F	.10
"	Bro P	.33	.25	Dly	.10
"	Lgs P	.79	.40	Dly	.10
Victoria, Brazil	Mia P	1.41	.50	Su,W	.40
"	No P	1.90	.50	Su,Tu,F	.40
"	Bro P	1.90	.50	M,F	.40
"	Lgs P	2.46	.65	Su,Th	.40
Villahermosa, Mexico	Mia P	.49	.40	Su,W,F	.10
"	No P	.49	.40	Su,Tu,F	.10
"	Bro P	.43	.25	Dly	.10
"	Lgs P	.90	.40	Dly	.10

ATLANTIC LINES

Botwood, Newfoundland	Nyk P	.81	.40	Twice wk	.15
England via Foynes*	Nyk E	(Rates	on	Application)	.30
"	Nyk P	(Rates	on	Application)	.30
Foynes, Eire via Botwood	Nyk P	1.78	.50	Twice wk	.30
" " via Lisbon	Nyk P	2.00	.50	Fortnightly	.30
"	Nyk E	1.78	.50	.....	.30
Hamilton, Bermuda	Nyk F	.55	.25	Twice wk	.10
Horta, Azores	Nyk P	1.70	.40	Weekly	.30
Lisbon, Portugal	Nyk P	2.00	.50	Weekly	.30
Scotland via Foynes*	Nyk E	(Rates	on	Application)	.30
"	Nyk P	(Rates	on	Application)	.30
Shediac, N. B.	Nyk P	.51	.25	Twice wk	.06
Wales via Foynes*	Nyk E	(Rates	on	Application)	.30
"	Nyk P	(Rates	on	Application)	.30

ALASKA LINES

Aniak Alaska	Ste P	1.08	.40	"	.06
Bethel, Alaska	Ste P	1.11	40	Schedules not published	.06
Burwash Landing "	Ste P	.72	.40	"	.06
Fairbanks, "	Ste P	.90	.40	"	.06
Flat, "	Ste P	1.05	.40	"	.06
Galena, "	Ste P	1.00	.40	"	.06
Juneau, "	Ste P	.56	.25	Schedules not published	.06
Lake Minchumina "	Ste P	.95	.40	"	.06
McGrath, "	Ste P	1.00	.40	"	.06
Moses Point "	Ste P	1.07	.40	"	.06
Nome, "	Ste P	1.11	.40	"	.06
Tanacross "	Ste P	.81	.40	"	.06
Tanana, "	Ste P	.95	.40	"	.06
Whitehorse, Canada	Ste P	.66	40	"	.06

CANADIAN LINES

Calgary, Alb.	Nyk T	1.02	†	Dly	.06
Edmonton, Alb.	Nyk T	1.06	†	Dly	.06
Halifax, N. S.	Nyk T	.31	†	Dly	.06
Lethbridge, Alb.	Nyk T	.44	†	Dly	.06
" "	CubW	.04	†	Dly	.06
London, Ont.	Nyk T	.22	†	Dly	.06
Montreal, Que.	Nyk C	.12	†	Dly	.06
" "	Nyk T	.12	†	Dly	.06
North Bay, Ont.	Nyk T	.27	†	Dly	.06
Ottawa, Ont.	Nyk T	.18	†	Dly	.06
Regina, Sask.	Nyk T	.76	†	Dly	.06
St. John, N. B.	Nyk T	.31	†	Dly	.06
St. Johns, N. F.	Nyk T	.55	†	Dly	.06
Sydney, N. S.	Nyk T	.36	†	Dly	.06
Toronto, Ont.	Nyk A	.16	†	Dly	.06
"	Nyk T	.16	†	Dly	.06
Vancouver, B. C.	Ste U	.08	†	Dly	.06
"	Nyk T	.56	†	Dly	.06
Windsor, Ont.	Nyk A	.20	†	Dly	.06
"	Cg A	.12	†	Dly	.06
"	Nyk T	.20	†	Dly	.06
Winnipeg, Man.	GfNW	.04	†	Dly	.06
"	Nyk T	60	†	Dly	.06

* British Overseas Airways Corp. carries from Foynes, Ireland to destinations in England, Scotland, and Wales.

† Canadian air express is carried on the same basis as air express within the U. S.: $50 declared value free; excess charged at 10 cents per $100 or fraction thereof.

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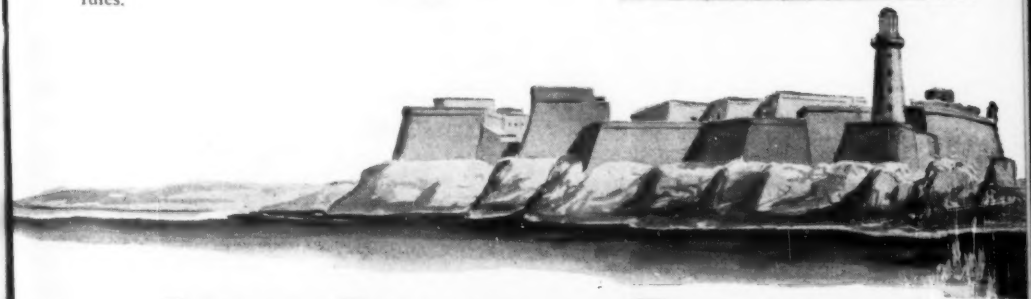

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